ROCKS and MINERALS

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

JULY 1948

Contents for July, 1948

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

COMING EVENTS

Mineralogical Club of Hartford
OUTINGS FOR 1948

July 25—Lancaster, Mass.
August 15—North Groton, N. H. (2 day trip)
August 29—Tilly Foster Iron Mines, Tilly Foster, N. Y.
Sept. 12—Upper Merryall Quarry
Sept. 26—Chester, Mass.
Blanford, Mass.
Oct. 10—Roxbury, Conn.
Oct. 24—Lincoln, R. I.
Nov. 14—Open Date

Meeting Place—249 High Street, Hartford, Conn.
Time—9:00 A.M., on the dot, except 2 day trip which will start at 8:00 A.M.

Anyone needing transportation or can take some one, please call one of the following committee:

	Tele. No.
George P. Robinson	Hartford, 7-9670
Arthur T. Safford	Hartford, 3-0341
Robt. Brandenburger	Hartford, 5-3365
George Dunbar	Hartford, 54-4887
Mr. Clark	

International Geological Congress
18th Session—Great Britain, 1948
Aug. 25-Sept. 1, 1948
(A. J. Butler, Gen. Sec. Geological Survey and Museum, Exhibition Road, London, S. W. 7, England)

Some 1,100 geologists from countries overseas plus British geologists will swell the attendance to over 2,000. Twenty-eight Governments and about 160 universities and scientific institutions will be represented at this, the world's greatest geological congress which meets every two years and each time in a different country. Field trips to many geological and mineralogical localities are on the program.

Northwest Federation Convention
Sept. 4-5, 1948
Bozeman, Mont.
(H. E. Murdock, Vice-President, Bozeman, Mont.)

Death of James G. Manchester

Just as we were going to press, word reached us of the death of Mr. James G. Manchester, who passed away at the age of 76, in the Southampton, L. I., N. Y., hospital on June 28th.

Mr. Manchester was one of America's most noted mineralogists. A member of the New York Mineralogical Club, the Mineralogical Society of America, New York Academy of Sciences, American Association for the Advancement of Science, and the Rocks and Minerals Association, he was widely known in mineralogical circles.

Mr. Manchester was a popular lecturer and the author of many mineralogical papers including one book. Two of his popular papers appeared in *Rocks and Minerals*: "50 years mineral collecting from Maine to Florida," Aug. 1940, pp. 255-260; and "Collecting semi-precious stones in Florida," Dec. 1941, pp. 435-454. His book, "The minerals of New York City and its environs," published January, 1931, by the New York Mineralogical Club. is the finest known on mineral localities.

We hope to print a story of his life in an early issue of *Rocks and Minerals*.

Rocks and Minerals May Come Out Bi-Monthly!

Beginning with the September issue (our 22nd anniversary number), *Rocks and Minerals* may come out every other month. We are forced to have the magazine come out bi-monthly because of the unsettled conditions in the printing industry.

For a number of years the magazine has been coming out late and we have received and still are receiving complaints from our subscribers, at times hot and heavy and many of them, because of the lateness of the arrival of their copies.

The unsettled conditions in the printing line and other branches of industry have been quite a strain on us and we must get some relief. We believe that issuing the magazine every other month, for about a year or so, until conditions become normal, would be the logical step to take.

A number of new features are planned for *Rocks and Minerals* and these will be carried out after the magazine becomes a bi-monthly.

The subscription price will remain the same, $3.00 a year, but we will increase the number of pages in each issue.

ROCKS and MINERALS
PUBLISHED MONTHLY

JULY
1948

Edited and Published by
PETER ZODAC

RAMBLES IN A COLLECTOR'S PARADISE
Part 2

By HORACE W. SLOCUM
320 Charlotte Ave., Rock Hill, S. C.

Four localities near Natural Bridge, N. Y.

I have never owned an old copy of Dana's *Mineralogy*. One that was more specific as to locations than the present day revisions are. So on my first visit to Natural Bridge, N. Y., I was unaware of the existence of such a place as the Ashmore Farm. This was on July 9, 1938. That day I was using Agar's notes. It would seem from a reading of the notes that the place he described would be easy to find. But I did not find it so. It was only thru sheer accident and a natural curiosity that I discovered it. And as I have before stated, I was unaware that the pit into which I nearly fell was that famous Ashmore Farm locality mentioned in Dana.

Mr. Zodac had written of his experiences at Natural Bridge. (*Rocks and Minerals*, Jan. 1936, page 6). How he enquired for the Ashmore Farm. How no one with whom he talked had ever heard of the place. So I presumed it "lost" and never asked about it on this trip. On July 16, 1938, while talking with Mr. F. W. Palmer of Natural Bridge, I happened to mention that the location was, alas, known no more. Mr. Palmer was very much surprised that this was so. For as he stated, it was now known as the Whitestone Farm. He gave me a description of the place and directions for finding it, and lo and behold it was the pit which I had found on my first visit.

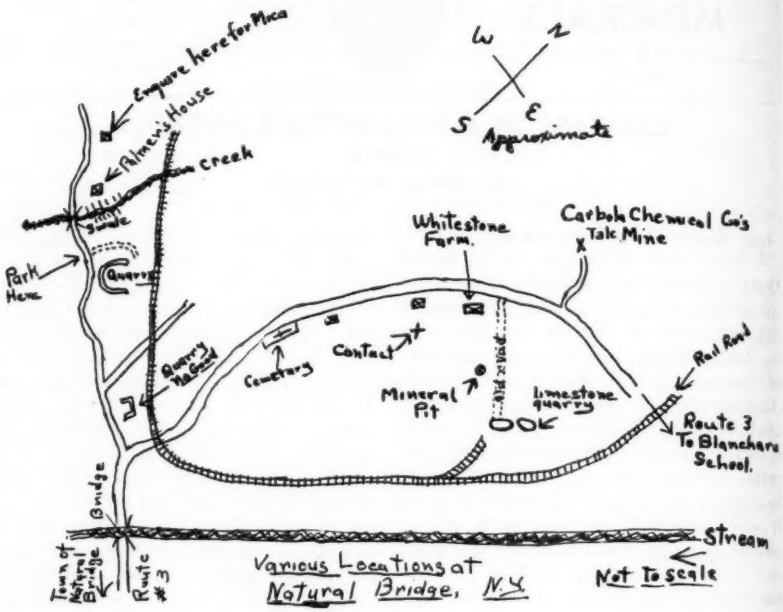
In first describing this location let me quote from Agar.

Perhaps with what instructions I can add you may be able to find it easily.

Mr. Agar—Quote.

"About 1 mile east of the lower artificial bridge in Natural Bridge, along the road to Blanchard School, an old quarry is visible about 170 meters south of the road. In a line with the old incline to the furnaces and the larger of the two shacks at the head of the quarry (Author's note: The furnaces and shacks are gone.) *100 meters toward the road* from the shacks, there is a pit 2 meters deep and 15 meters long on the limestone-syenite contact. This and the adjoining field form one of the mineral localities of the neighborhood. They have been pretty thoroly picked over (Author's note: ? ?) but in spite of this the following may be found: Pyroxene, massive and green crystalline aggregates with considerable titanite imbedded in them; tremolite; wernerite in brown silky aggregates and as small light grey to pink crystals; phlogopite; scapolite (meionite) in silky light green stubby crystals developed on the actual contact." End of quote (*Am. Min.* Nov. 1921, p. 162)—Agar.

From the above you would think that this location was easy to find. As I said before, I did not find it so. The furnace was gone as well as the shacks. In fact I did not know I was on the right property. True, there were two huge limestone pits down in that pasture. But you may not look in any direction in that country without seeing a limestone pit. There was nothing of interest in these pits, and I confess I did not take too great heed of the words which I have underlined for you, viz: *100 meters back toward the road.* (The main road.) So it took a lot of floundering around in what was no longer a field, but what with time had grown up into a brushy pasture, to finally find the place. O BOY! O BOY! when I got there! ! ! Hoed out pyroxene crystals and clusters from the soil on the western bank of the pit. Dug



A jumble of rock at the mineral pit, Whitestone Farm, Natural Bridge, N. Y.

up scapolite and titanite from the old dumps at the other end of the pit. Got good green cleavages of calcite from down in the pit, and patted myself on the back all the way to the car for making such a good haul! Returned one other time and collected again. This time I used up a whole forenoon and came away with the same minerals, but inmuch better quality!

To reach this place easily—leave Natural Bridge and drive east on route 3 toward Blanchard School. After ¾ to9/10 of a mile, enquire for the Whitestone Farm. Ask at the house for permission to visit the pit. The road to the limestone pits is just to the left of the house as you face it. Go down this road about one half way to the pits and turn right into the pasture. Go about 20 to 30 yards and cast circles from here. You will find the mineral pit in a very short time. One thing to remember —the farm house is within sight of the pit thru the trees. One other thing to note—the Carbola Chemical Co.'s mine road leads left off the Blanchard School road just beyond the Whitestone Farm. There was a sign there in 1938. If you drive to this point you are just beyond your location.

If you have any time left after prospecting the Whitestone property, drive ¼ mile back toward Natural Bridge. Here on your left stands a small white house which sits high on a bank. In back of the house in a field is a contact between the syenite and limestone which may be followed the length of the field. It is probably a continuation of the same vein as that at the Whitestone Farm. But here, when I investigated the minerals, tho visible deep down in crevices, were unavailable. So I only looked and came away. As there was no one at home at the house when I called I did not feel I was privileged to do more than investigate. A pinch of blasting powder here, in shallow holes, would work wonders. Perhaps some one has tried it before now. Somehow I doubt it.

As you continue on back to Natural Bridge, notice a road entering from the right just before you turn left to go across the bridge. Take this road. (I believe it was a dirt road in 1938.) Follow it for ¼ mile. You will pass an open

Note the farmhouse in the background, Mineral Pit, Whitestone Farm, Natural Bridge, N. Y.

Digging at the mineral pit, Whitestone farm, Natural Bridge, N. Y.

quarry on the right. Nothing of interest here. Continue on, ¼ to ½ mile until, in making a slight turn you can look across a swale thru which runs a narrow creek. Beyond the creek on the right of the road, and placed well back from it, is a large brown house. Stop the car where it is. Do not cross the swale yet. Back up to where some trees on your right form a fringe along the base of a short steep hill. You will notice a cart track leading right, along the side of the hill. I have forgotten whether there were bars here or a fence. But remember there was space to park the car where the cart track met the road. Follow this cart track about 200 yards, bearing right with it. It will lead you into a small quarry which is close to the road over which you came in the car, but which cannot be seen from this road.

The western end of this quarry is a series of pockets or caves which contain, for want of a better word I shall call them curtains, of limestone. Both sides of these curtains are covered with calcite crystals up to 4" in length. There are rhombohedrons, nail-head, and dog-tooth crystals all mixed together. The curtains are easily broken out. The calcite crystals are stained red and yellow from percolating waters which does not add to their beauty. But 4" crystals! ! ! Not so often available nowadays.

Near the center of the northern face of the quarry there is a band of dark smoky calcite which makes attractive cleavage specimens. Disseminated in many of the boulders on the quarry floor are small crystals and aggregates of pale pink diopside and reddish brown wollastonite. Agar says that in these boulders may also be found spinel in clear well formed octahedra of a rich blue color, some as large as 6 mm. My experience with this latter leads me to believe that it is now non-existant. At the eastern end of the quarry in some small dump piles I found two specimens of the spinel. A perfect sky-blue color and about 2 and 3 mm in size. Spent most of one whole afternoon searching for more. Tried to match the matrix on which these specimens occurred to the wall rock of the quarry, and to the numerous boulders scattered about. Had no success at this, nor any

luck in pawing over the remaining dump. Still that is no proof that no more exist. You may be luckier or smarter than I.

When you have loaded your bags at this mine, drive on across the swale and stop at the next house on the right. Here lives (or did when I was there) Mr. F. W. Palmer. Mr. Palmer, who worked at the Carbola Co's mine, has a few mineral specimens and has been known to exchange some of them for certain coin of the realm. In any case he is very agreeable, knows the surrounding country well and it is a pleasure to talk with him. The morning I was talking with Mr. Palmer his next door neighbor was in attendance. This gentleman, whose name I unfortunately forget to write down, went home (next house beyond Palmer's on the right) and returned bringing me several fine phlogopite crystals. He also extended a cordial invitation for me to visit his "mica mine". A week later I did so only to find the gentleman away. So I never saw his mine. But I advise you to look him up because the phlogopite crystals he gave me were 6" across, 1"thick, unweathered and with a bright bronze lustre. I treasure them highly. Beside the mica there may be, very possibly is, accessory minerals in that quarry for you to collect.

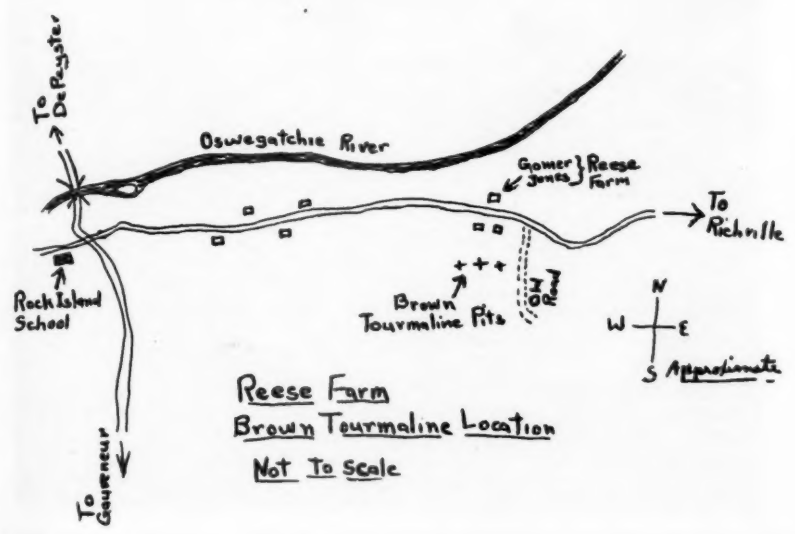
In ending this long ramble I wish to pay as fine a compliment to the people who I met up there in Northern New York as I know how to write. Not one of them but what was cordial, not one but what gave me the heartiest invitation to prospect on his land. A number said, "Sure, go ahead. If you find any gold we'll both get rich." To a collector, this kind of a welcome given cheerfully, is as refreshing as an ice cold Coke after three hours in a quarry where the sun beats down on your back and is reflected up in your face, while both sides of you get a thoro roasting.

Tourmalines, The Brown Variety

This will be a much shorter ramble than the previous ones. For Dahlburg has stated the directions for getting to the Old Reese farm as well as they can be written. Which leaves me only the necessity of adding a few trimmings.

Mr. Dahlburg—Quote.

"The farm is reached from Gouverneur by taking the road to De Peyster, turning right on the Richville—Rock Is-



West face of the quarry near Palmer's and grottoes. The calcite crystals come from these caves

land road (just south of the Oswegatchie River) and going for about ½ or ¾ mile." End quote Dahlburg—(*Rocks and Minerals,* Aug. 1947, p. 720).

The farm at the time of my visit, May 22, 1938, was owned by a Mr. Gomer Jones. The farm house is on your left as you travel toward Richville. Across the

North face of the quarry near Palmer's. Draw a line straight downward from the base of the tree. It will pass thru the smoky calcite vein.

Along this ridge thru the fields and woods are the famous Reese Farm tourmaline pits, Richville, N. Y.

road are the barns.

Directly back of the barn the land sweeps up thru a pasture to the brow of a low ridge which parallels the road. Just over this ridge are the old pits; in fact some of them are within sight of the house. To the left of the barn as you face it, is an old cart track which may be followed to the top of the hill. From here turn right thru the field and bearing

One of the brown tourmaline pits on the Reese Farm, Richville, N. Y.

right again you will see the pits where others long before us have prospected. A scattering of trees along the top of the ridge conceals several of the pits and produces a cool shade in which to work. And here you must work if anything of value is to be accomplished. Break open such limestone boulders as you may find scattered around; for within them you may find the brown crystals you are looking for. Dig in the old pits with your pick hammer. Some crystals and pieces of crystal will come to light in this manner. I confess I had no great luck here. For the time I had to spend on any one locality was strictly limited. However I gathered several part crystals from one pit, and upon breaking a number of limestone chunks one parted and left a 2" perfect brown tourmaline in high relief against the white matrix.

Now brown tourmaline is all right to collect, but don't let the fact that this is one of the famous tourmaline collecting grounds blind you to another fine material that is to be found here. I speak of the tremolite that is still to be found in good crystals thru the limestone and especially in one of the old pits. Take along several good pieces and as time goes on you will come to regard these specimens very highly, tho at the time of collecting when you are after tourmalines they may be thought of only as accessories.

Brown tourmaline is not rare around Gouverneur tho I had very little luck in getting real fine specimens. Perhaps other quarries would produce it today in better quality than the Reese farm. At DeKalb Cross Roads is an old quarry in which, the Diary notes, we found more. These are the only two places it was available to me. The lack of time is responsible for no further search.

Gold is Where You Find it. So is Danburite.

I've often wondered how many "run of the mine" collectors like myself have specimens of danburite on their shelves. Considering the fact that the original locality near Danbury, Conn., played out many many years ago and considering the fact that the dumps at the So. Russell (tho it's nearer Edwards) locality had not seemed disturbed since Agar visited them in 1919, I would be led to believe that danburite was, as Valiant puts it, "a rare

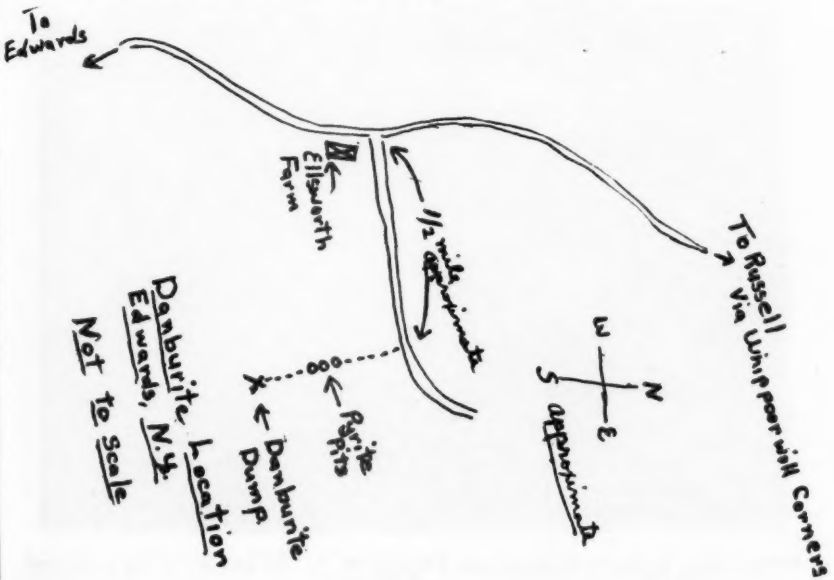
Across this pit in the woods good tremolite as well as brown tourmaline is found. Reese Farm, Richville, N. Y.

article no longer obtainable." The accounts written by those who have been around So. Russell and mentioned danburite simply say, "It was a hard place to find so we gave it up." I can heartily agree with them about it being hard to find. But persistence and the right notes conquer even the hardest places; and danburite is rare enough to spend some time on, even if like myself you only have an hour or two left to collect after you discover the spot where it occurs.

Agar gives directions for finding the place by starting at Russell, N. Y. And I agree that it can be found with his notes. But the miles of country road you must travel and the questions you must ask at every other farmhouse are time consuming; so I would suggest you start at Edwards by traveling north on route 87 toward Hermon. About 1 mile beyond Scotland School a third class road bears right and runs northeast to an intersection on the road from Russell to So. Russell. Note this road on your map. Where this road turns off route 87 stop and enquire for the Ellsworth farm. Agar's notes call it the Van Buskirk farm but it has changed hands and is known by the former name. It is perhaps ¾ mile along this country road. After you have located the farm your troubles have only started.

As you face the farm house you will note an old road to your left. Follow this old road (on foot) until it turns slightly left. It will have brought you almost to the top of a ridge. Leave the road and turn right thru the pastures, it is not far. Slightly higher on the ridge you will find an outcrop of rusty gneiss which has been blasted in several places by prospectors looking for pyrite. Continue southwest along this ridge in line with the pyrite pits and in the matter of 100 to 200 yards the danburite dumps will be found. They are well overgrown but digging produces clear small crystals, (I have one 1" long) large opaque crystals and clusters, and massive danburite which tho it looks similar to quartz has a decided cleavage.

I am going to quote Agar on this locality in addition to the above. Between the two of us you will be better prepared to attempt this locality, for as I said before, it is not too easy to find.



Mr. Agar—Quote.

"One half mile back of the farm, along the southeast-running road and 160 meters southwest of it, (at the point where the road takes the first turn) on the high ridge of rusty gneiss, the danburite is found." End Quote —Agar. (*Am. Min.* Nov. 1921, p. 160.)

Now here is a chance to add a really worthwhile rare specimen to your collection. Take your time, run it down, and let us ramble on to a not too distant field which contains a very different mineral.

A Serpentine Occurrence

Did you ever notice a stray cat in a new alley? Humans are very much the same in some respects. For when they get into a new town they usually wander around to see what they can find to interest them. So it was with us when we first came to Gouverneur. One of the first things we noticed was a collection of local mineral products which was gathering dust in the building that houses Gouverneur's town offices. There were marbles of different shades and textures, specimens of talc, and some indifferent mineral specimens. Only one of which I remember in particular. This polished piece I never forgot. It was serpentine of a hard compact character. The polished face showed the most peculiar scrolls and spots of red, green and white. For book ends, ash trays, paper weights, etc., it was superb material. However like all the other specimens there, it was unlabeled. Nor could I find any one who knew where these samples came from. The mineral tho, was so oddly beautiful that I never forgot it. Of course I would have liked to collect some; but unable to find from whence it came turned to matters of more promise.

Now the day we made the trip for danburite we also prospected Pierrepont for black tourmaline. After that we looked up the Fida Scott feldspar quarry, and after a tussle with wrong directions finally found it. Also, because we were in the immediate vicinity, we prospected the road cut so often written about. The one near the junction of route 58 and 3 where route 3 crosses the East Branch, and where innumerable collectors have found nodules of purple fluorite and tiny titanite crystals (*Rocks and Minerals* Jan. 1937, page 8). With all this collecting as well as the long hard search for the

Dumps where danburite is found, near Edwards, N. Y. The pits are in the brush back of the boy.

Another view of the danburite location near Edwards, N. Y.

danburite location, you can be reasonably sure that as we started home for Gouverneur we were very very tired.

This is the only fact I can use to alibi myself for the unfortunate error of losing the location of the red, green and white serpentine previously mentioned. We left Edwards, N. Y., on route 58 for Fowler and Gouverneur. It was along toward dusk and we were anxious to get home quickly. Just why we stopped again I can't at this late date explain. And what is *most* unfortunate of all I can't say just where. Along the road somewhere on our left, close to the road and surrounded by a field we came upon an abandoned quarry. It is barely possible that we stopped and went across the road and around back of the ledge into the small pit, as my sister used to say when she was very small, "to catch a rabbit". Anyway thru the dullness of fatigue and hunger I realized that here of all places was the ledge from which the specimen of serpentine in the Gouverneur Town Hall had come. Such was the urgency to get home however, to get food, to clean up and sink restfully into a soft bed that I never lifted a hammer to break off a piece. Thus it is that for not noting the place on the map and procuring a specimen I have ever since, whenever the matter came to mind, delivered a swift kick to my mental backside. I can quote you the Diary on the subject.—"Stopping once to inspect the quarry which might have been the place where the red, green and white mottled serpentine in the Gouverneur Town House came from.—It appeared to be the same, but we were so tired we gave it little thought nor took away any specimens."

To sum up this place. It is on the left side of route 58 going from Edwards to Fowler. I believe it is before you cross the stream known as the West Branch. Any way it is fine material and will be worth your time to look up; for the distance between the towns is not great. The quarry is right beside the road and should not be too hard to discover. If you should find it, please collect an extra piece and send it to the writer. In doing so you will lessen by one the self inflicted kicks I am forced to bear. Tho I doubt whether only one less will ever be noticed.

(*To be continued*)

CAN YOU TOP THIS?

By FRENCH MORGAN
2601 Brentwood Road, N.E., Washington, D. C.

It was during August, 1928, when returning to Washington from our first auto trip through the West, that we stopped at a small variety store in Livingston, Montana, to make a purchase of post cards before proceeding to Yellowstone Park. It was here I saw Montana moss agate for the first time. My two sons became very much interested, and on making inquiry of the proprietor of the store we learned that he did his own collecting down the river all the way from Forsyth to Glendive.

After leaving the Park we hit the Yellowstone again at Billings and stopped to look up a commercial cutter we had heard about. He owned a large establishment and had good cutting equipment and a large display of cut stones. He was a very pleasant fellow to talk to but would not give us the slightest hint of where to obtain equipment or how to get started in cutting and polishing, even though I explained that my son would like to take it up as a hobby.

Disappointed here, we drove on to Forsyth for the night. The owner of the tourist camp where we stayed was a kindly man and told us where to look for agates and even gave us a rough specimen so we would know what to look for. Up at five o'clock the next morning, we hit the trail early and it took until six that evening to make the 122 miles into Terry. We had searched the gravel bars in every stream crossed and had probably 30 pounds of material, good, bad and indifferent, mostly indifferent as we learned years later upon becoming better acquainted with agates.

It is one agate of this find to which I wish to invite attention; not so much to the stone itself, which may be classed as ordinary, but to a subsequent developement which is very unusual, to say the least.

This particular agate was slab-shaped and not very large, measuring about two by three inches by one and one-fourth inches thick, with a quarter inch band running parallel with the top and bottom faces, a little closer to one face than the other. The material on one side of the band was entirely clear but was somewhat milky on the other side. The band or stripe was the only marking. It presented the usual water-worn appearance of this type of agate, and was regular in every way except a clear fracture across one end indicating it had been broken at one time and one part of it was missing.

Ten years passed and it was in 1938 when I began lapidary work. The above mentioned stone received my first attention and furnished the material for the first cab which I prize very highly. Five years passed and it was in 1943 when several members of the Mineralogical Society of the District of Columbia met at my residence to consider the formation of a cutters club. Among the members present was Mr. W. T. Baxter, author of a book on metal craft and gem cutting.* He immediately spied the stone Mrs. Morgan was wearing, and with a puzzled expression, said he did not remember giving me that stone. Upon being informed that we had found it he was much surprised and said it was hard to believe since he had one exactly like it.

A few weeks later I took a slab of this agate to Mr. Baxter's residence and there we made careful examination of it and the one he had that looked like it. It did not take an expert to see that both slabs were from the same agate and were alike to the minutest detail.

We agreed on the following facts; In 1928 I found part of the agate on the Yellowstone River. In 1940 —12 years later—he purchased the remaining part of the agate from a Montana dealer. Each of us cut cabochons, and then three years later, in 1943, the two parts of the stone were again united, this time in Washington, D. C.

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* *Jewelry, Gem Cutting and Metalcraft*, McGraw-Hill Book Co., New York, N. Y., 223 pp. (1938).

GEOLOGIC TIME COMPUTATIONS

By RONALD L. IVES
Vice-President, Rocks and Minerals Association

INTRODUCTION

Methods of determining the age of a mineral having a radioactive component are outlined in most geology and mineralogy texts. Usually, the description is either so involved that the average geologist cannot understand it; or is oversimplified so that a somewhat false impression of the methods involved is given (1).

The following description has been worked out in an effort to present the methods with substantial accuracy, while at the same time avoiding unnecessary mathematical involvement.

FUNDAMENTAL CONCEPTS

When a radioactive substance disintegrates under conditions normally encountered in nature, the products of this disintegration are not only recognisable, but the quantities of the end products bear a definite and determinable relation to the amount of radioactive material which has disintegrated.

Using Uranium as a convenient example, one atom of Uranium (at. wt. 238.17), after radioactive disintegration, produces one atom of lead (at. wt. 206), eight atoms of helium (at. wt. 4) and radiation (equivalent to the .17 of at. wt. not otherwise accounted for). In consequence, the actual weight of Uranium which has disintegrated is 238.17/206 times the weight of Uranium-derived lead present, or 238.17/32 times the weight of Helium present.

These two figures should agree; any marked discrepancy indicating that the substance under consideration has either lost (common) or gained (not common) some of the products of radioactive disintegration.

The radioactive substance and its disintegration products are commonly separated from the parent rock, and from each other, by chemical means which are theoretically simple, but operationally laborious and time-consuming. Determinations are usually made from unweathered crystals of radioactive minerals, from which (it is hoped) loss of radioactive material and disintegration products by solution and other means has been negligible.

Within the ranges of time, space, and concentration normally encountered in nature, "The number of atoms disintegrating in unit time is proportional to the number of atoms available at the instant considered" (2). The quoted material is from the "classical" theory of radioactivity, which, so far as is now generally known, is still valid for natural situations. The prefatory phase is made necessary by recent investigations involving critical concentrations of radioactive materials, in which the classical rates are apparently greatly exceeded.

FUNDAMENTAL EQUATION

The foregoing "classical" description of the rate of radioactive disintegration can be restated, for the purposes of this discussion as "the rate of disintegration of a radioactive substance is proportional to the amount present". This is demonstrated mathematically in Table 1. which is the general formula for the amount of radioactive disintegration of any substance under natural conditions.

Equation (1) is a simple differential equation. The rate of disintegration carries a minus sign at this point for convenience. This rate of change of amount is negative, because it leads to a reduction in the amount of material present. This equation is restated to become (2), of which both sides are integrated to produce (3).

In most geologic computations involving radioactivity, the figure desired is the time that has elapsed since disintegration began. Because the half-life of each known natural radioactive substance has been determined, and is, by definition, in

(1) One of the better descriptions is contained in Schuchert and Dunbar, *Textbook of Geology* Part II, Fourth Edition, eighth printing, New York, 1947, pp. 67-71.

(2) Hevesy, George, and Paneth, F. A. *A Manual of Radioactivity*, Oxford Univ. Press, 1938, p. 138. See also Soddy, Frederick, *Radioactivity*, London, 1904, p. 114.

(1) $-\frac{dX}{dT} = kX$ In which. X = the amount of radioactive substance present at a given instant

(2) $\frac{dX}{X} = -k\,dT$ $-\frac{dX}{dT}$ = the rate of disintegration at the same instant

(3) $\ln X = -kT + C$ k = constant of proportionality

or

$X = C_1 e^{-kT}$ $\ln X = \log_e X = 2.303 \log_{10} X$

If no time has elapsed e^{-kT} is one ($e^0 = 1$) and $C_1 = X$. This is then the initial quantity of radioactive material present, and will be designated Z to prevent confusion in consequence

(4) $X = Z e^{-kT}$

TABLE 1.

each case, the time necessary for half of the pure substance to disintegrate radioactively, we may derive from (4) the following:—(See Table 2.)

$\frac{X}{Z} = \frac{1}{2} = e^{-kt}$ t = half life of substance under consideration

so that.

$-\ln 2 = -kt$

and

(5) $k = \frac{\ln 2}{t}$

From this, k may be evaluated, known the half-life of the substance under consideration, or the value of k shown by (5) may be substituted in (4) to produce the equation.

$X = Z e^{-\frac{\ln 2}{t} T}$

which is converted to.

$\ln X = \ln Z - \frac{\ln 2}{t} T$

by standard algebraic processes, which, further applied, produce.

(6) $T = t\frac{\log Z - \log X}{\log 2}$ (see note 3)

In which.

T = time elapsed since disintegration began

t = half-life of substance disintegrating

Z = original amount of substance present

X = amount of substance now present

TABLE 2.

(*) Because logarithms to any base differ from those to any other base by a constant factor, which is here present in both numerator and denominator, and hence may be "cancelled out", use of logarithms to any base desired is permissible. Common, or Briggs, logarithms, to base 10, are usually most convenient and most easily available.

PRACTICAL EXAMPLE

From chemical analyses, it is found that a given large sample rock now contains 12 grams of Uranium, and that 4 more grams of Uranium, once present, are now represented by disintegration products, chiefly lead and helium.

The half-life of Uranium, as determined from standard physical tables, is 5,000,000,000 (five billion) years. How much time has elapsed since the rock sample was solid enough to retain the disintegration products of Uranium?

The time necessary for the solution of this problem is ordinarily about five minutes, provided the mathematical tables are readily accessible. Although the reasoning, unavoidably, goes into the realm of "high powered" mathematics, the computations involved in an actual solution consist only of one subtraction, one division, and one multiplication. (See Table 3.)

From the above data

$X = 12$

$Z = 12 + 4 = 16$

$t = 5 \times 10^9$ years

T is the unknown and desired figure

From standard mathematical tables

$\log X = \log 12 = 1.07918$

$\log Z = \log 16 = 1.20412$

$\log 2 = 0.30103$

Substituting these values in (6):

$$T = 5 \times 10^9 \times \frac{1.20412 - 1.07918}{0.30103} = 5 \times 10^9 \times \frac{12494}{30103}$$

$$= 5 \times 10^9 \times 0.415 = 2.075 \times 10^9 \text{ years}$$

Ans. $T = 2,075,000,000$ years

TABLE 3.

This formula (6) is a convenient form of the "attrition" formula used in many fields of science, and both the formula and the mathematical reasoning upon which it is based can be applied, with only nominal modifications, to many problems (4).

(4) By setting X equal to the charge on a condenser, this same formula can be used to evaluate the time of discharge through a resistance, and to determine numerous other electrical circuit constants.

SUMMARY AND CONCLUSIONS

The formula (6) here derived and explained is neither new nor spectacular. It, or its mathematical equivalent, was almost certainly discovered by the Curies early in their study of radioactivity, and has been employed in connection with many practical studies of radioactive disintegration.

Within the ranges of values normally encountered in nature, this formula permits transition from chemical data to definite time determinations with a minimum of both computations and error. The formula should not be applied to very great concentrations of radioactive material ("critical mass") nor is its use desirable where dilution of radioactive material is very great, as the reasoning involved is valid only for whole molecules. Within this limit, however, computations will be restricted in accuracy only by the limitations of the analyses and tables used.

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ACKNOWLEDGEMENTS

The writer is indebted to Dr. C. F. Deiss, Department of Geology, Indiana University; and to Dr. K. P. Williams, Department of Mathematics, Indiana University, for helpful suggestions and a critical reading of this paper.

BUY
U. S. SAVINGS
BONDS

THE LEAD MINES OF HAMPSHIRE COUNTY, MASS.

By EDWARD C. FOSTER
Instructor of Science, Williamsburg (Mass.) High School

The lead mines of Hampshire County are easily reached by car from Northampton, Massachusetts. Northampton, county seat of Hampshire County, is situated on the west bank of the Connecticut River and east of a region of hills known as the Berkshires. None of the lead mines are more than ten miles from the center of Northampton, although a few localities producing galena, etc. are a bit further. By taking State Route No. 66, two of the better known localities are to be found, the old Manhan Silver Lead mine, in Loudville, being the more famous; and the other, located on the farm of Joseph Schranz, is less than 100 yards from the main highway. The Hatfield Lead-Barite Mine is located on U. S. Route 5, about two and a half miles from the center of Northampton.

In the Loudville region more than fifty shafts and prospect holes have been started[1] and many of the holes are not protected. In view of that fact the present owner of the Manhan properties, the D. E. Hartnett Estate, is naturally cautious about granting permission to collectors due to the obvious dangers involved.

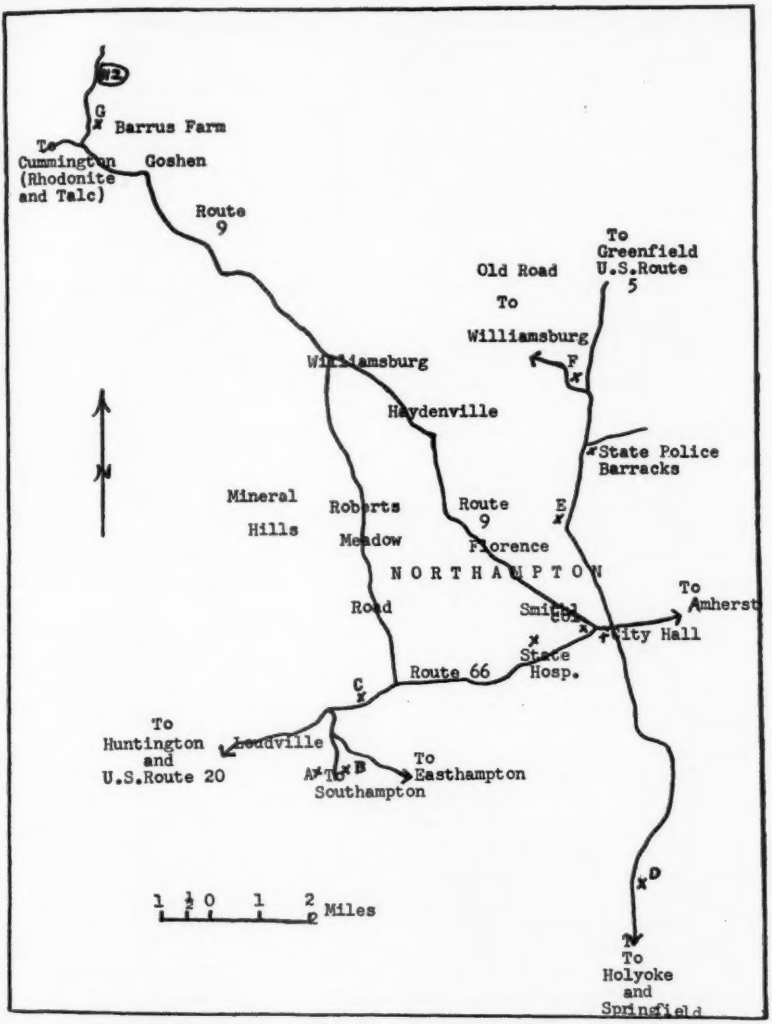
The Manhan Mine was probably the largest and most successful mineral mining venture in Western Massachusetts, certainly the oldest. A notice appearing under date of October 16, 1679, in the records of Nonotuck, now Northampton, gives credit to Robert Lyman as the discoverer. Colonel John Pynchon, of Springfield had an interest in the mine. In 1765, Ethan Allen, with others, took possession[2] of the property. Their mining engineer reports that "***the vein is the largest I have ever seen. The first stone taken out of the back of the vein weighed 200 weight, almost solid lead."[2] Six hammers, or stamps were used for crushing the ore[3] and the ore was then washed of its gangue by water. Not much more information is available about the activities until the early nineteenth century, but it is known that bullets were cast from lead smelted here during the Revolution[4] and it is quite probable that this mine supplied lead for the War of 1812, the Mexican War and the Civil War. In 1865 the last transfer, as a mining venture, was made to the Manhan Lead Company for $950,000.00.[5]

That there still exists a possibility of reopening the mines at some future date may be gleaned from an address by the late owner, Mr. D. E. Hartnett, before the Northampton Historical Society, October 1, 1940. Mr. Hartnett said in part: "***I have been approached by outside interests about reopening the mines**** I will tune in with any group or concern***who desire to reopen, operate and completely finance such an enterprise". Mr. Hartnett has since passed away and the probabilities, at least in the immediate future, of reopening the mine are slim.

The South Shaft of the mine is within twenty five feet of the Loudville-Southampton Road, and is estimated to be considerably over 100 feet deep. The vein descends vertically into the country rock of granite and mica schist. Water accumulation was a major problem and a 1100 foot horizontal adit was blasted out of sandstone, granite, mica schist and serpentine. The vein is 6 to 8 feet wide and has as its principal mineral galena, with small amounts of chalcopyrite, bornite and sphalerite and as their decomposition products azurite, malachite, wulfenite, cerussite and anglesite. Pyromorphite, calcite, pseudomorphs of quartz after calcite and fluorite,[6] and cotunnite[7] have been reported. Quartz, with barite being the principal gangue minerals, is present in crystalline and massive forms and also as a drusy coating.

The vein, with 12 to 20 ounces of silver to the ton of ore, was a good producer, but unable to stand the pressure of economics, is now lost to the collector. This, as with other barite-lead veins in the vicinity, was deposited during or post Triassic since they appear in the Triassic sandstones and in the older rocks.

For the present collector there are still



Map showing some mineral localities around Northampton, Mass.

- **A. Main vein, Manhan lead-silver mine.**
- **B. South Shaft, Manhan lead-silver mine.**
- **C. Schrantz farm lead mine.**
- **D. Dinosaur tracks (State Park).**
- **E. Northampton granite quarry (allanite xls).**
- **F. Hatfield lead mine.**
- **G. Barrus farm with its pegmatite minerals.**

available hundreds of specimens of lead and silver bearing ore, which can be found on the property. However, the specimens can hardly be considered indicative of what lies underground because they represent the waste rejected when brought up from the mine and these piles of waste have been worked over by the collectors, who naturally carried away the best they could find, for the past seventy five years.

About a mile north of the Manhan properties, on the farm of Mr. Joseph Schranz, another vein of considerable importance was opened. Since the dumps are visible from the highway and there are few danger points, Mr. Schranz is quite cordial to collectors. On May 19, 1935, the Massachusetts Division of Rocks and Minerals National Outing was held here and it was at that time that Professor George Bain of Amherst College found a good specimen of wulfenite, previously unreported form this locality. The vein on the Schranz Farm is several feet wide and has been explored to a considerable depth,[8] through granite and mica schist. A dissimilarity exists between this vein and the Manhan vein in that the amount of sphalerite seems to be greatly increased and the amount of galena subsequently reduced. Copper minerals are also more common.

Two openings were undertaken in the Hatfield mine; one, a short distance north of the old road to Williamsburg, has a slanting shaft with a vein width of one foot at the surface increasing to three feet at the bottom. Further west the other vein has been opened for a depth of twenty feet. It is four feet wide at the top and eight feet wide at the bottom.[9] The main filling of the vein is again quartz and barite. Galena, sphalerite, pyrite and chalcopyrite are the primary ores with cerussite, malachite, pyromorphite, and limonite as decomposition products.[10]

There are other veins of lead-barite to be found in the vicinity, particularly in Williamsburg, Whately, Conway, Westhampton, and Leverett as reported by Nash,[11] but no attempt has been made to work them to any extent except the Leverett veins which did not pay. However, Emerson[12] reports that the Leverett veins produced the best sphalerite crystals obtained from any of the veins.

Those collectors who are visiting this region for the first time should not fail to visit the dinosaur tracks on the bank of the Connecticut River, (collecting is forbidden since it is a State Reservation) and the old granite quarry with its allanite crystals which are to be found on the southwest wall. A warm welcome will be extended to the visitor at the Barrus Farm, long famous for its tourmaline, spodumene, goshenite and other pegmatite minerals. Hitchcock[13] found a single crystal of cassiterite at this locality. The justly famous rhodonite for polishing is to be found in Plainfield at the Betts[14] manganese mine, about six miles from the Barrus Farm. Two miles farther, at the top of Deer Hill, is an abandoned talc quarry with pyrite in abundance.

The region as a whole is very interesting from a geological, mineralogical and paleontological standpoint and the collector can well put in a profitable and enjoyable weekend using Northampton as a base for operations.

The writer would like to take this opportunity to express his appreciation to Mr. and Mrs. William Kitchen, who live a hundred feet from the South Shaft of the Manhan Mine, for their kindness and courtesy in receiving him, for the valuable material presented to him and for their forebearance with his curiosity and "rock pounding".

Incomplete additional references not cited in the text, but interesting reading, referring to the Manhan Mine are as follows: 1810—B. Silliman and W. Meade in *Bruce's Journal,* Vol. I, pgs. 63 and 149. 1819—Amos Eaton in *Am. Jour. Sci.* 1st series Vol. 1, pg. 136. 1827—Alanson Nash, *Am. Jour. Sci.* 1st series Vol. XII, pg. 238 et. seq. 1863 C. T. Jackson and C. S. Richardson, Manhan Silver Lead Mining Company, Hampshire County, Massachusetts, Geol. Surveys and Reports, March 1863, Boston, Alfred Mudge and Co. 1866—C. U. Shepard, *Am. Jour. Sci.*

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[4] Evert's History of the Connecticut Valley in Massachusetts. Vol. I, pg. 17.
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[10] B. K. Emerson, op. cit. pg. 506.
[11] A. Nash, Lead Mines of Hampshire County, Am. Jour. Sci. 1st series, Vol. XII, pg. 258.
[12] B. K. Emerson, op. cit. pg. 504.
[13] E. Hitchcock, op. cit. pg. 205.
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MINERAL COLLLECTING ON DUMPS

By S. C. BROWN

Stamford, Conn.

Some collectors think that the best specimens are obtained in mines and quarries by chiseling them out of pockets or from the surface of the strata and veins. In some instances many fine crystals and cleavages have been secured by this method, provided the crystals were not brittle, I have wrecked many a fine tourmaline and other brittle crystals with the chisel, especially in a hard pegmatite formation.

When the matrix is much softer, as is the Stockbridge Limestone formation in Canaan Conn., one may chisel out some fine tremolite crystals.

Now to return to the Dumps. We will first visit the Bedford, N. Y., quarries about 11 miles from Stamford, Conn.

Have combed the many dumps in these quarries and obtained excellant specimens from them, especially Autunite on reddish feldspar, crystals of Columl te, good platy pieces of Ilmenite, Garnets (some in matrix), the radio-active mineral Cyrtolite, Morion (black quartz), crystals of quartz, cleavages of feldspar and many other minerals.

Next we visit the Branchville, Conn., old feldspar quarry. During World War II this was worked.

Have picked up specimens of Beryl (both green and pink), fine specimens of Spodumene, Eucryptite, Columbite, curved Mica, Lithiophilite, and other specimens.

Then some distance to Roxbury, Litchfield County, Connecticut, we visited the old iron mine on Mine Hill, where siderite was the ore mined. Near the entrance to the mine there is a large dump. While it has not been worked in nearly one hundred years, by patient combing over the pile of rocks I have secured good specimens of Iron Pyrites (fine striated cubes), Galena, Chalcopyrite, some Lollingite, fine specimens of Siderite and Sphalerite, some fine small Quartz Crystals, and Opalescent Quartz.

While I did not go very far into the old horizontal mine tunnel due to poor lighting, I do not believe there was anything worth while to find there.

The next mine visited was the Tungsten Mine in Long Hill, Connecticut. Found it quite interesting and as usual explored the dumps and secured good specimens of white Topaz, crystals of Scheelite, Margarite, cleavages of Calcite, white Fluorite, and some fair Iron Pyrite cubes.

So far have mentioned four mines and quarries that I have visited and from their dumps obtained excellent specimens. Do not remember if I ever secured any good specimens by working them out of the walls of the workings with hammer and chisel.

A great many rock hounds do not possess patience and that is required in mineral collecting. I have often have picked up good specimens after several hounds had passed them by.

TEXAS MINERAL SHOW GOES OVER BIG!

By PETER ZODAC, Editor
Rocks and Minerals

The Annual Mineral Show of the State Mineral Society of Texas was held at Hotel Driskill in Austin, Texas, on April 17 and 18, 1948. It was a huge success not only for the large display of unusually fine minerals and gems but also for the unusually large number of visitors who were in constant attendance.

The exhibit was held on the second floor of the spacious hotel. The displays were most attractively arranged, lighting facilities were good, everyone most friendly and cordial, and a good time was had by all.

The Show was under the personal direction of Mr. J. J. Brown, President of the Society and a natural born showman. Not only did Mr. Brown have everything running smoothly, with an excellent corps of assistants (all pretty girls), but he saw to it personally that every visitor was made to feel "right at home".

As you stepped out of the elevator into a large hall, you were amazed at the many people milling about. You squeezed through and a registration table, surrounded by girls (Mr. Brown's assistants), was before you. The girls were so friendly, cordial, and good looking, you were in a quandary—should you go on ahead and inspect the minerals and gems on display whose well-lighted cases were beckoning you or should you tarry awhile with the pretty girls. Your mind, however, was soon made up for you. "I'm J. J. Brown," boomed out a cheery voice as your hand was firmly grasped by a big man. You were introduced hurriedly to the girls and then, "Come on and I will have you meet the rest," and you went—you couldn't argue with a big man.

We never saw such a friendly group, both exhibitors and visitors, as those we met at the Texas Show. Though Mr. Brown was everywhere introducing people as they came in, in most cases introductions were not necessary.

As to the displays, there was a little of everything and a lot of somethings. Gems and gem material were everywhere with agate, petrified wood and jaspers predominating. Crystallized minerals, loose crystals, ores, and even rock specimens were well represented with many unusually fine specimens. The famous large fine selenite specimen, owned by Mr. A. E. Curry, of San Angelo, Texas, was there in all its glory and most prominently displayed and it received considerable attention. How this large and easily damaged specimen can be safely transported (it has been exhibited at many shows) mystified us until Mr. Curry relieved our worry by explaining that the selenite had a special box which had been made for this very purpose.

Quite a number of exhibitors demonstrated sawing, sanding, gem cutting and polishing to large and keenly interested groups. It seemed only too evident that a large majority of visitors were more interested in cutting and polishing than in any other phase of mineralogy.

Mr. Jesse Burt, of San Antonio, Texas, had a very nice exhibit of crystals and crystallized minerals, many from Arkansas. Noting our interest in his exhibit, he not only opened up his cases so we could see the specimens better, but most generously gave us some—much to our embarrassment. Ordinarily it it a pleasure to accept as gifts interesting specimens but to take them out of an exhibit which was not half over was too much and we remonstrated but to no avail. "Go on," he replied, "there are a lot on display and the ones given you will never be missed".

The Woodwards, of Alpine, Texas, had such a large display of agate slabs (in the thousands and no two alike) that it was amazing. These all came from their ranch and we hope that someday they will send us a few notes on the occurrence for printing in *Rocks and Minerals*.

The polished, fluorescent, fossilized marble paperweights exhibited by Clay Ledbetter, of Waco, Texas, fascinated us and they deserve a write-up. Someday,

perhaps, Mr. Ledbetter may send us an article on them.

To our sincere regret we never made any notes on the exhibit as it was not convenient, due to the many visitors present. We wanted also to talk to the exhibitors but this too was not convenient except in a very limited way—we did manage to say a few words to Lowell Gordon of Long Beach, Calif.

And before it slips our mind, we must comment favorably on the very fine fluorescent exhibit which was in a room all by itself and in charge of Bill Odom, of Austin, Texas. And was Mr. Odom kept busy! It seemed that half of the people of Austin went to that room to witness the fluorescence of the minerals on display—many made repeated trips. Col. Fain White King, of Cairo, Ill., had the largest and finest display and no wonder, as he has, perhaps, the largest assortment of fluorescent minerals in the country. The Franklin, N. J., specimens, displayed by the Garden State Minerals, of Hoboken, N. J., received very favorable comments.

Well, the Texas Mineral Show has come and gone but its remembrance still lingers on. It will be years before time will dim the recollection of this great show and if we never attend another one we can always go back in memory to the two happy days spent in Austin, Texas, April 17 and 18, 1948.

The following collectors or companies had exhibits at the Mineral Show, (data furnished by the State Mineral Society of Texas):

Applewhite, J. E., Laredo, Texas.

Bailey, R. L., Brownwood, Texas.
Basket, Dr. L. G., Del Rio, Texas.
Bitner, Mr. and Mrs. Fred H. of Mineral Specimen Co., Santa Monica, Calif.
Boak, C. C., Tonopah, Nev.
Brown, J. J., Austin, Texas.
Bryant, Dr. Vernon, McKinney, Texas.
Burgard, Mr. and Mrs. A. J., Alpine, Texas.
Burns, Rev. Aaron H., West Point, Texas.
Burt, Jesse, San Antonio, Texas.
Byron, J. E., Boulder, Colo.

Carter, Mrs. Mary, Luling, Texas
Carter, Mike H., Luling, Texas.
Churchill, J. D., Dallas, Texas
Clabaugh, S. E., Austin, Texas.
Cobb, H. S., Boulder, Colo.
Curry, Mr. and Mrs. A. E., San Angelo, Texas.

Double H Gem Cutters, Glendale, Ariz.

Elliott's Gem Shop, Long Beach, Calif.
El Paso Lapidary Co., El Paso, Texas.
Estlack, J. C., Clarendon, Texas.

Fischer, Mrs. Richard, Grand Junction, Colo.
Fudcek, Roy, Muldoon, Texas.

Gault, Mrs. Ferris, Agua Dulce, Texas.
Gault, R. E., Agua Dulce, Texas.
Garden State Minerals, Hoboken, N. J.
Gene's Agate Shop, Portland, Ore.
Gordon, Lowell R., of Gordon's, Long Beach, Calif.

Haskell, R. N., Austin, Texas.
Heinz, C. E., Texas Industrial Minerals, Llano, Texas.
Hill, Harry P., Austin, Texas.
Hoard, C. F., Corpus Christi, Texas.
Humphries, Mrs. Helen, San Antonio, Texas.
Humphries, Loyal, San Antonio, Texas.

Ivey, Mrs. Jewel, Taft, Texas.
Ivey, Maurice, Taft, Texas.
Ivey, Warren, Taft, Texas.

Johnston, L. T., Austin, Texas.

Karviel, Mrs. Lela, San Antonio, Texas.
King, Col. Fain White, Cairo, Ill.

LaDew, Wm. H., Dallas, Texas.
Lakeland Minerals, Hayfield, Minn.
Lapidary Hobbycrafts, Cleveland, Ohio.
Lawrence, J. W., Austin, Texas.
Ledbetter, Clay, Waco, Texas.
Lee, Orville, Del Rio, Texas.
Litsey, John, Dallas, Texas.
Luoma, Henry, Ahmeek, Mich.

McIver, R. C., Dallas, Texas.
Mewburn, Lloyd T., Banff, Canada.
Miner, The, San Diego, Calif.
Morgan's Jade Shop, Lander, Wyo.
Mueller, Dr. Ralph, Kansas City, Mo.
Murphy, Joe, San Antonio, Texas.
Murphy, Mrs. Rose, San Antonio, Texas.

Odom, Bill, Austin, Texas.
Osborn, Dr. A. C., Gonzales, Texas.
Osborn, Linda, Gonzales, Texas.
Owens, Mrs. Edith, Honey Grove, Texas.
Owens, Jimmie, Honey Grove, Texas.
Owens, Kenneth, Honey Grove, Texas.

Parker, Jimmie, Austin, Texas.
Peck, Robt. T., Dallas, Texas.
Perry, Loran, Pasadena, Calif.
Pierrepont, Dr. C. G., Texarkana, Texas.

Quinn, C. H., San Antonio, Texas.

Rochester, Ed, Winterhaven, Calif.
Rogers, Mr. and Mrs. B., of R & B Art-Craft Co., Los Angeles, Calif.

Sabin, V., San Antonio, Texas.
Sallas, B., Dallas, Texas.
Saranac Lake Craft Guild, Saranac Lake, N. Y.
Shick, Grover, Santa Monica, Calif.
Silvertooth, John, Antelope, Ore.
Skillin, I. S., Freeport, Maine.
Smith, Mrs. Robt., Rockdale, Taxas.
Spillmann, Emil H., Austin, Texas.
Spillmann, Mrs. Mildred K., Austin, Texas.
Springer, C. G., Bend, Ore.
Squaw Peak Mining Co., Camp Verde, Ariz.
S-T Gem & Mineral Shop, Tujunga, Calif.

Texas Minerals, Burnet, Texas.
Trescott, J. B., San Antonio, Texas.

University of Texas, Bureau of Economic Geology, Austin, Texas.
Unrah, Lee, Salem, Ore.

Valley Stone House, N. Hollywood, Calif.
Vreeland Mfg. Co., Portland, Ore.

Woodward, Frank, Jr., Alpine, Texas.
Woodward, Frank, Sr., Alpine, Texas.

The judges at the show were:
Wm. H. LaDew, Robt. T. Peck, T. D. Copeland, all of Dallas.

Ribbons were awarded as follows:

CLASS I

(Best display of polished material.)
1st Dr. Vernon Bryant, McKinney
2nd R. E. Gault, Agua Dulce
3rd Maurice Ivey, Taft

CLASS II

(Best individual polished specimen)
1st Dr. Vernon Bryant, McKinney
2nd A. J. Burgard, Alpine
3rd Maurice Ivey, Taft

CLASS III

(Best General Display of rocks and minerals based on variety.)
1st J. J. Brown, Austin
2nd Jesse Burt, San Antonio
3rd Joe Murphy, San Antonio

CLASS IV

(Best General Display of rocks and minerals based on quality.)
1st A. E. Curry, San Angelo
2nd Edith Owens, Honey Grove
3rd Jimmie Parker, Austin

CLASS V

(Best Unusual Display.)
1st Harry P. Hill, Austin
2nd Orville Lee, Del Rio
3rd Bill Odom, Austin

Grand Prize Winners:
(Best exhibit of ten polished specimens.)
Dr. Vernon Bryant, McKinney
J. C. Estlack, Clarendon
Clay Ledbetter, Waco

Mr. R. C. McIver, of Dallas showed slides of beautiful specimens.

Mr. Peter Zodac was the principal speaker at the luncheon on Saturday, April 17, 1948.

The following offices were elected for the ensuing year:

J. J. Brown, President; Mrs. Mildred K. Spillmann, Secretary-Treasurer; Mrs. Edith Owens, Historian.

The following Directors were elected:

Dr. C. G. Pierrepont, Texarkana; L. T. Johnston, Austin; J. C. Estlack, Clarendon; Frank Woodward, Alpine; Clay Ledbetter, Waco; E. W. Handy, Tom Ball; D. W. Danielson, Muleshoe; Maurice Ivey, Taft; A. E. Curry, San Angelo; Joe Murphy, San Antonio; Bob Gault, Agua Dulce.

The Mineralogical Show closed on the evening of April 18, and at 9 A.M. on April 19, plans were under way for next year's show.

ROCKS AND MINERALS, THE MINERALOGIST, LAPIDARY JOURNAL, AND DESERT MAGAZINE had representatives taking subscriptions.

The members of the Texas Mineral Society of Dallas had a joint exhibit.

Insurance for the show was handled by Mr. Jack Carter of Luling. The night guard for the show was Mr. Bill Fairchild of Austin.

The following out-of-state "rock hounds" visited the show and it was indeed a pleasure to have these distinguished visitors:

Mr. and Mrs. Carl F. Ashe, Asbury Theological Seminary, Wilmore, Ky.; Mr. and Mrs. Sebastian J. Asterfeldt, 329 W. Log, Dawn River, Wisc.; Mr. and Mrs. Fred Bitner, Mineral Specimen Co.,

Santa Monica, Calif.; Mr. R. R. Burton. 32 Janson Road, Southampton, England; Clifford J. Carlson, Wesley, Iowa; Mrs. Selma A. Carlson, Wesley, Iowa; P. J. Dominique, 3010 St. Ann St., New Orleans, La.; Don Gabriel, 14564 Grandmont Road, Detroit, Mich.; Bessie Gladdign, Gasport, N. Y.; Lowell R. Gordon, 1850 E. Pacific Highway, Long Beach, Calif.; Chester R. Howard, Denver, Colo.; Col. and Mrs. Fain White King, 2700 Washington Ave., Cairo, Ill.; W. W. Leonard, 589 Unadilla St., Shreveport, La.; Mr. and Mrs. J. R. Calif.; Dr. Ralph E. Mueller, 3701 Valentine Road, Kansas City, Mo.; Mr. and Mrs. John H. Newton, 1300 Grand St., Alemeda, Calif.; John C. Osmond, 124 Ellis Road, Havertown, Pa.; R. A. Parnell, Kyle, W. Va.; Henrietta Pulvermiller, 519 Wayne St., Mansfield, Ohio; Mr. and Mrs. L. A. Rogers, 11021 S. Vermont Ave., Los Ange'es, Calif.; Mrs. Henry Wubben, Armstrong, Iowa; Peter Zodac, 157 Wells St., Peekskill, N. Y.

STORY OF GOLD MOVIE

Sponsorship of movie production of "The Story of Gold in California" by the California Centennials Commission or other agency was urged May 13, 1948, by the Board of Directors of the San Francisco Chamber of Commerce.

Bert C. Austin, chairman of the Chamber's Mining Committee, pointed out that representatives of the gold mining industry feel that insufficient attention and recognition has been given to the industry in connection with California Centennial celebrations.

"Production through the California Centennial's Commission or other agency of a motion picture portraying the discovery of gold in California and its influence on the growth of the state and nation would be very constructive and arouse great public interest," he declared.

Production of the proposed film could be financed by some $30,000 to $75,000 of the two million dollars provided for the use of the California Centennials Commission, according to Austin.

He also pointed out that films on other industries have been sponsored by various companies and now constitute a film library circulated under the direction of the U. S. Bureau of Mines.

"The possibilities of producing such a film on gold mining have been reviewed by the State Division of Mines," Austin said, "and the agency has promised its hearty cooperation in the film's production and distribution."

ON THE OCCURRENCE OF NATIVE SULPHUR AT LANGLEY, VA.

By DR. TITUS ULKE
Washington, D.C.

On Sunday, May 23, 1948, Ned Blandford discovered a quantity of a loose yellow powder, which proved to be tiny crystals of rhombic sulphur in some large cavities once filled by bright crystals of iron pyrite up to a cubic inch in size, some unchanged, while others have been partly or wholly oxidized to dark brown limonite, in massive white quartzite, in a quarry near Langley, Va.

This unusual occurrence may be explained as being the result of the reduction by organic matter of the iron pyrite. It is analogous to the reported occurrence of sulphur on the bottom of the Black Sea, due to the probable reducing action of inflowing organic matter on sulphates or sulphides present in the bottom ooze, or that of the large deposits of native sulphur near Petit Anse, La., probably formed by the reducing action of Petroleum on gypsum.

WORLD NEWS ON MINERAL OCCURRENCES

(Bureau of Mines **Mineral Trade Notes**, January, 1948)

I. METALS

BERYL

SOUTH WEST AFRICA.—Small quantities of beryl have been produced from time to time from the pegmatites of the Omaruru and Karibib districts and from the Oorlogskloof pegmatite deposits on the farm Border No. 155, 26 miles from Makop Siding, Warmbad district. In the past, no single deposit has been capable of producing more than a few tons as byproduct in the working of the pegmatites for other minerals, and it appears that the possibilities for producing any appreciable quantity of this mineral are limited.

(Minerals Attaché William O. Vanderburg, Pretoria.)

CESIUM

SOUTH WEST AFRICA.—Pollucite, the principal source of Cesium, was discovered 18 miles south of Karibib in 1941. In 1942, about 25 long tons had been recovered but was held in stock owing to a lack of markets for the mineral. Present stocks are about 60 tons.

In 1941, a specimen of the mineral was submitted to the Geological Survey of the Union of South Africa, where it was identified as pollucite. An analysis of the pure mineral was made by Dr. C. F. J. van der Walt as follows: 45.7 percent SiO_2, 17.2 percent A_2O_3, 30.2 percent Ce_2O, 1.3 percent Rb_2O and K_2O, 2.8 percent of Na_2O, and 2.65 percent H_2O.

The pollucite occurs massive associated with quartz, lepidolite, and a claylike mineral. The deposit occurs in flat-lying areas, and the mineral has been mined from a small open cut. Insufficient prospecting has been done to determine the extent of the deposit, but it appears probable that at least several hundred tons of hand-cobbed ore could be produced.

During the war cesium assumed strategic importance because of its use for infra-red photography.

Three tons of pollucite have been shipped to New York and 500 pounds to Philadelphia in an effort to find markets for the mineral. These shipments sold for £140 a ton and are reported to have averaged 28 percent Ce_2O.

(Minerals Attaché William O. Vanderburg, Pretoria.)

COPPER-LEAD-SILVER

SOUTH WEST AFRICA.—Virtually all the copper, lead, zinc, silver and cadmium produced in South West Africa is from the Tsumeb mine, just north of Tsumeb in the northern part of the Otavi Mountains.

In 1892, when South West Africa became a German Protectorate, the German Government, in order to develop the mineral resources of the territory, granted a concession to the South West Africa Co., Ltd. Under this concession, the company had exclusive mining rights to an area of 22,000 square miles, which it proceeded to explore for minerals. A number of mineral deposits were investigated, including the Tsumeb mine. On April 6, 1900, the Otavi Minen und Eisenbahn Gesellschaft was incorporated in Berlin to acquire from the South West Africa Co., Ltd., the mining rights to 1,000 square miles including the Tsumeb and Otavi mines and certain freehold rights, together with 197,000 hectares of land with certain freehold and mining rights along the right of way of the Otavi Railway.

In 1906, the Otavi Minen und Eisenbahn Gesellschaft completed the construction of a narrow-gage (2-foot) railway from Swakopmund to Tsumeb, a distance of 356 miles. A branch line from Otavi to Grootfontein was completed by the South West Africa Co., Ltd., in 1908. Both lines were purchased in 1910 by the German Government for £1,250,000. The first shipments of ore from the Tsumeb mine were made in 1907.

During World War I, South West Africa was occupied by Union troops, and the port of Walvis Bay was connected with Swakopmund by rail, and the narrow-gage railroad from Swakopmund to Usakos was replaced by a standard

Cape-gage (3 feet, 6 inches) line. The German company retained control of the property after the war and continued operations until the outbreak of World War II. During World War II, the Tsumeb mine and other assets were taken over by the Custodian of Enemy Property and in the latter part of 1946 the assets of the former company were acquired by the Tsumeb Corporation, Ltd., controlled by American capital. Currently the Tsumeb Corporation is dewatering the mine and building a 900-ton daily capacity flotation mill, diesel plant, and other facilities. The company was shipping in the latter part of 1947 approximately 7,500 tons of concentrates a month obtained by jigging dump material. Dewatering of the mine was expected to be completed about the middle of 1948.

The formation in the vicinity of Tsumeb comprises a series of sediments some 15,000 feet thick known as the Otavi system. At the top of the system there is a series of arkoses and grits underlain by the Dolomite series, while at the base is the Nasib series of conglomerates, sandstones, and arkose.

The Tsumeb ore body is on the northern flank of a syncline within the bedded dolomite just below the quartzite series. It is a pipelike deposit averaging about 1,500 square meters in horizontal section and an average dip of 60 degrees, more or less conformable to the bedding. In the center of the ore body is an oval body of sandstone, which at first was identified as aplite, but later investigations showed it to be of sedimentary origin. The ore has been followed without a break from the surface to the 20th level or a vertical depth of 580 meters. The oxidized zone extended to a depth of about 230 meters below the surface. In the sulfide zone the minerals are in an extremely fine state of division and consist of massive sulfides and arsenosulfides, namely, pyrite, chalcopyrite, bornite, germanite, sphalerite, enargite, tetrahedrite, galena, and chalcocite. The total metal content of the ore body is very constant, the combined weight of the copper, lead, and zinc forming about 45 percent of the whole.

The complex nature of the Tsumeb ore has given rise to a number of metallurgical problems. When the mine closed down in 1940, the production was about 170,000 tons of ore a year, of which 60,000 tons were exported direct to Europe for treatment. The grade of the shipping ore averaged about 11 percent copper, 28 percent lead, 12 percent zinc, with appreciable quantities of silver and cadmium. About 33,000 tons of ore with a high zinc content were stock-piled at the mine, and the remaining 77,000 tons were smelted locally. The smelter produced a copper matte containing 42 percent copper, pig lead containing 98 percent lead, and cadmium flue dust containing 36 percent cadmium with a high percentage of arsenic. Cadmium is an important constituent of the Tsumeb ore, the ratio of zinc to cadmium being 23:1.

The oxidized ores near the surface of the mine are exhausted.

A number of other copper prospects are found within a radius of 20 miles of the Tsumeb mine, but work on these has indicated that the deposits are too small and too irregular to be of commercial importance. Among these prospects are the Gross Otavi, Asis, Asis East, Guchab, Otavi, and Nosib.

The African Metals Corporation, Ltd., in 1938 carried on prospecting operations in a large area in the western part of the Bethanie district, including the old Sinclair mine, which was worked in the latter years of the German protectorate and produced a small quantity of shipping ore. Copper in the form of chalcocite occurs in a series of parallel quartz veins in andesite. However, the quantity of payable ore was too small, and the Sinclair mine remained inactive. The mine and equipment were purchased by the South West Graphite Co. in 1947.

(Minerals Attaché William O. Vanderburg, Pretoria.)

GOLD

SOUTH WEST AFRICA.—Most of the gold produced has been from the Ondondu-Otjiwapa area, Omaruru district, with small quantities from the

Rehoboth district. Production has been from both alluvial and vein deposits. While gold has been reported from a number of other places in South West Africa, none have given promise of any substantial production.

Interest in gold mining has been revived from time to time in the Omaruru and Rehoboth districts by well-financed companies, but results were not encouraging. The Ondondu gold area is on the Otjohorongo Native Reserve, about 55 miles north-northwest of Omaruru and 60 miles west of Kolkveld, a station on the narrow-gage railroad connecting Usakos and Tsumeb. Numerous auriferous quartz veins in schists are distributed over the area and range in width from mere stringers up to 4 feet.

Interest in the gold deposits of the Rohoboth district has been revived from time to time, but the returns have not been in proportion to the money spent. In this area, quartz veins, lenses, and stringers are of common occurrence, but the distribution of the gold is too sporadic, with no indications of continuity at depth.

Other occurrences of gold have been worked from time to time, but the production has been negligible and, viewed in the light of past experience, there does not seem much likelihood of the Territory becoming a substantial gold producer.
(Minerals Attaché William O. Vanderburg, Pretoria.)

TANTALITE

SOUTH WEST AFRICA.—Tantalite-columbite concentrates have been produced intermittently in small quantities as a byproduct of tin mining. The mineral is found associated with cassiterite in stanniferous pegmatites, and owing to the close association of the two minerals they occur together in the alluvial and eluvial deposits. The tantalite is distributed sporadically throughout the Erongo tin fields, in the Brandburg area, Omaruru district, and at Donkerhoek, Karibib district.

First recorded production of tantalite in South West Africa was in 1927, when 0.3 ton of concentrate was exported. The peak output was in 1935, when 6.1 long tons valued at £1,530 were produced and exported. Total production for the last 20 years, from incomplete records, probably has not exceeded 20 tons, all of which was exported.

The average of tantalic and niobic acid content of the concentrates ranged from 65 to 76 percent. The tantalum oxide generally exceeds the niobium oxide in the ratio of 2:1.
(Minerals Attaché William O. Vanderburg, Pretoria.)

TIN

SOUTH WEST AFRICA.—Tin in the form of cassiterite was first discoverd in South West Africa about 1908. The first recorded production was in 1912, when the value of exports amounted to £414. In 1913, the value of exports increased to £34,500.

The primary source of the cassiterite is the large number of pneumatolytically altered pegmatites in granite, which extend over several thousand square miles south and southwest of the Erongo Mountains, in another area to the west of Okombaho, north of the Erongo, and in a third area to the south and east of the Brandburg.
(Mineral Resources of the Union of South Africa, Department of Mines, Pretoria, 1936, p. 417.)

Secondary deposits of alluvial and eluvial tin have been formed by the erosion of the pegmatites.

During the latter years of the German Protectorate, a number of companies were found to exploit the tin deposits. Considerable money was spent in prospecting and exploration, but results indicated that the tin content in both the pegmatites and placer deposits is too irregular and patchy to be worked on an extensive scale.

The principal constituent minerals in the pegmatites are feldspar and quartz, with subordinate quantities of mica. Tin, tantalite, wolframite, and semiprecious stones have been recovered from the pegmatites and alluvial deposits by natives using wooden bateas for dry concentration. From time to time small gravity concentration plants have been built to

recover the tin from the pegmatites. Dry processes of concentration have been invented by members of the staff of Pretoria University and by the Krupp Works in Germany on ideas formulated by O. Ortner Omaruru, but neither of the processes attained wide acceptance.

As is characteristics of pegmatites, the distribution of the cassiterite and other economic minerals in the pegmatites is sporadic and sparse to justify large investments of capital, although no doubt small tonnages of tin concentrates will be produced for many years.

A list of minerals found in the pegmatites in South West Africa, compiled from publications of the Union Geological Survey, follows:

Garnet	Tourmaline	Marcasite
*Cassiterite	(schorl)	Sillimanite
Quartz	Apatite	Azurite
Feldspar	Fluorite	Clinozoisite
Muscovite	Biotite	Baddeleyite
*Beryl	Pollucite	Cookeite
*Lepidolite	Zircon	Hallerite
*Tantalite	Phenacite	Rubellite
Triphylite	Bertrandite	Paragonite
Kaolin	Polianite	Semipreciou.
Andalusite	*Petalite	gems
Sericite	Lazulite	*Rose quartz
Corundum	Monazite	*Tourmaline
Nontronite	Molybdenite	Blue
Hematite	Bismuthinite	Pink
Limonite	Bismuth	Green
*Wolframite	Arsenopyrite	*Topaz
Triplite	Chalcopyrite	*Aquamarine
Fluorapatite	Bornite	*Amethyst
Zinnwaldite	Tetrahedrite	*Smokey quartz
*Amblygonite	Malachite	*Helioder
	Pyrite	

*Minerals of economic importance.

The pegmatites in the Erongo Mountains area are divided into three groups: (1) tourmaline pegmatites, (2) garnetiferous pegmatites, and (3) tin-bearing pegmatites.

(Minerals Attaché William O. Vanderburg, Pretoria.)

TITANIUM

INDIA.—The 1944 output of ilmenite in Travancore totaled 100,794 long tons, and rutile 1,646 tons.

Titanium minerals are widely distributed in India and constitute an important source of total mineral wealth. About 75 percent of the world requirements of ilmenite, normally about 200,000 to 300,000 tons annually, were derived from the Travancore sands before 1939.
(Geological Survey of India, Indian Minerals, vol. 1, No. 1, Jan. 1947.)

SOUTH WEST AFRICA.—Rutile deposits have been opened on the farms Erongo Ost No. 82 and Kanona Ost No. 81 in the Omaruru district. The existence of rutile on these farms was known for many years, but it was believed to be too low-grade to warrant exploitation. The first production was made in 1936 when 28 long tons were produced by hand picking and primitive methods of concentration. The concentrates averaged about 96 percent rutile. In 1937 production amounted to 46 tons, but work was stopped because the price was too low for profitable mining.

Rutile occurs in an extensive body of pegmatite cutting through aplitic granite. It was estimated in 1937 that the ore reserves were 128,000 tons, averaging 4 percent TiO_2, from which about 5,000 tons of rutile concentrates could be recovered.
(Minerals Attaché William O. Vanderburg, Pretoria.)

TUNGSTEN

INDIA.—Indian output of wolfram in 1944 totaled 30 long tons, and was all from Jodhpur state.
(Indian Minerals, vol. 1, No. 1, Jan. 1947, Geological Survey of India.)

SOUTH WEST AFRICA.—Tungsten minerals, principally wolframite, occur in pegmatites in association with cassiterite and tantalite in the Erongo area, in pegmatites cutting granite at Nakais, Warmbad district, and in narrow but persistent veins in granite and schist at Krantzburg, 12 miles southwest of Omaruru. Considered from the viewpoint of world production, the output of concentrates from

the territory has been small.

The most productive deposits are those at Krantzburg, which were operated in former years by the Krantzburg Mines, (Pty.) Ltd. The wolframite occurs in a conical hill rising about 1,500 feet above the subjacent terrain. The hill is composed of schists and quartzite intruded by granite and capped with melaphyre. In addition to wolframite, cassiterite, scheelite, tantalite, and beryl also have been found in Krantzburg. The mines were closed in August 1944.
(Minerals Attaché William O. Vanderburg, Pretoria.)

VANADIUM

INDIA.—Vanadium-bearing titaniferous iron ores are found in Singhbhum and adjacent parts of Mayurbhanj, the vanadium content ranging up to 4 percent and over. Minimum reserves are 2 to 3 million long tons. Economic methods of producing vanadium from these ores is under investigation. These ores might also be used for their titanium content if the Travancore ilmenite deposits become exhausted.
(Indian Minerals, vol. 1, No. 1, Jan. 1947, Geological Survey of India.)

SOUTH WEST AFRICA.—South West Africa has been an important producer of vanadium concentrates mined from the deposits in the dolomites of the Tsumeb-Grootfontein area.

Vanadium was first discovered in South West Africa about 1912, but no production was recorded until 1920, when the output was 360 long tons of concentrates. In recent years the major part of the vanadium concentrates has been obtained from the Abenab mine, owned and operated by the South West Africa Co., Ltd. The Abenab mine, 26 miles north of Grootfontein, the nearest railing point, has been developed to a vertical depth of 680 meters below the surface. It is reported that the ore reserves of this mine are nearly exhausted. The concentrates produced by table concentration average about 19 percent V_2O_3.

In former years the Otavi Minen und Eisenbahn Gesellschaft produced vanadium from the Tsumeb, Karavatu, and other properties within its concession area but, owing to the low grade and complex character of the concentrates, difficulty was experienced in marketing the output.

The vanadium minerals mottramite, vanadinite, and descloizite are generally found in brecciated dolomite.

Other vanadium occurrences in the vicinity of Grootfontein and Tsumeb that have either been prospected or worked in former years are the Uris, Tsumeb West Friesenberg, Uitsab, Berg Aukas, Baltika, and Asis Nord.

Currently, the South West Africa Co., Ltd., is developing the Abenab West mine several hundred yards southwest of the Abenab mine. According to the Union Geological Survey (Geological Survey Memoir No. 39, Lead Deposits in the Union of South Africa and South West Africa, Department of Mines, 1944 pp. 139-143), a reeflike deposit of vanadium associated with lead is found in argillaceous and clayey material enclosed in limestone at the Abenab West mine. The ore minerals are descloizite, vanadinite, cerusite, minium, anglesite, smithsonite, and hemimorphite. Up to 1940, some 3,967 tons of ore from Abenab West treated at the Abenab mill yielded 714 tons of concentrates averaging 7.6 percent vanadium pentoxide.
(Mineral Attaché William O. Vanderberg, Pretoria.)

II. INDUSTRIAL MINERALS

ASBESTOS

SOUTHERN RHODESIA.—According to statistics supplied by the Department of Statistics and the Chamber of Mines, Southern Rhodesia, 40,105 short tons of asbestos were produced in the first 9 months of 1947.

CELESTITE

INDIA.—According to "The Mail," (Madras) January 5, 1948, celestite, one of the chief minerals employed in the production of strontium salts, occurs in the Trichinopoly (South India) district. It is estimated that 1,000,000 long tons of this mineral occur in this area, and another half million tons are reported to exist in the Mianwali district in the

Punjab.
(Chief Assistant A. Daniel, American Consulate General, Madras.)

DIAMONDS

SOUTH WEST AFRICA.—The beginning of the diamond industry in South West Africa dates from May 1908, when a Cape colored boy working on the railway line between Luderitz and Aus picked up several small diamonds in the sand near Kolmanskop, about 10 miles east of Luderitz. The diamonds were handed to August Stauch, a boss on the railway line, who reported the discovery to the Government geologist at Luderitz, as required by law. Considerable skepticism at first prevailed regarding this discovery of diamonds, but in a few weeks a large number of syndicates and individuals became active, and by August 1908 the entire area along the coast north of Pomona was staked out in claims. The Deutsche Kolonial Gesellschaft held nearly all the mining rights in this area, and the ground was pegged by prospecting licenses issued by this company. In September 1908, the company ceased issuing licenses and notified holders that they would be given 6 months within which to peg, after which time all licenses lapsed.

Stauch took out a license and pegged an area 2 miles wide by 6 miles long and subsequently made a fortune. The small syndicates and individual holdings were gradually amalgamated into a few companies, each holding a 50-year concession from the Deutsche Kolonial Gesellschaft, with the exception of the Fiscus Block along the railroad.

In 1927 phenominally rich diamond deposits were discovered by Dr. Hans Merensky in marine terraces at Alexander Bay, just south of the Orange River, in the Cape Province.

The diamondiferous area in South West Africa is a strip along the coast ranging from 2 to 12 miles in width and extending from the Orange River northerly to Conception Bay, a distance of about 375 miles.

According to Wagner and Reinecke (Wagner, Percy Albert, and Reinecke, Leopold, Mineral Deposits of the Union of South Africa, Third Empire Mining & Metallurgical Congress, Radford Adlington, Ltd., Johannesburg, 1930, p. 70), the diamonds in the eluvial deposits occur for the most part in the upper layer of loose detritus along the floors and troughs and in depressions. This layer is usually only a few inches thick, but may be up to 25 feet thick. It is composed principally of yellow sand with coarse material from 1 to 20 millimeters in diameter. The diamonds are concentrated with the coarse material, which is composed of milky quartz, white feldspar, yellow chalcedony, banded agate, red jasper, red garnet, epidote, magnesite, and specular iron.

The immediate concentration of the diamonds is brought about by the action of the wind that blows strongly from the south for many months of the year and takes the fine material out of the upper layers. Previous to this recent concentration, some of the diamonds had been deposited as gravels in old river beds of Cretaceous age.

The presence of fossil oyster shells along the old beach terraces in Namaqualand furnished the first clue to the occurrences of diamonds. Similar diamondiferous marine terraces were found later north of the Orange River in South West Africa.

Directly north of the Orange River, the raised diamondifeous marine terraces are covered with an overburden of sand as much as 30 feet deep. The diamonds produced from the marine terraces are much larger than those found in the fields to the north.

Several theories have been advanced regarding the origin of the diamonds found along the southwestern coast of Africa. One theory is that the primary source of the diamonds was the kimberlite pipes in the interior, from which they were brought down by the Orange River and its tributaries and redistributed by the action of the ocean currents and waves. A second theory is that the diamonds originated in submarine pipes near the coast.

During the days of German occupation of South West Africa, some 45 occur-

rences of kimberlite-filled pipes and dikes were prospected in the interior of the Territory, but in every instance, although the material contained the same constituents as the blue ground of the diamondiferous pipes near Kimberley and other parts of southern Africa, no diamond deposits of economic importance were found in them.

In 1946, the labor employed in the production of diamonds in South West Africa totaled 1,586, of which 156 were Europeans and 1,430 non-Europeans.
(Minerals Attaché William O. Vanderburg, Pretoria.)

UNION OF SOUTH AFRICA.—The lull in the diamond market in the early months of 1947 was of short duration, and in the latter part of the year sales improved considerably. The value of diamond sales for 1947 totaled £24,500,000, compared with £29,610,000 for 1946.

The work of reopening the Premier diamond mine, 25 miles east of Pretoria, continued during the year. This famous mine closed down in 1932, and dewatering of the open pit in preparation for underground mining began in February 1945. This work was completed in about 9 months. It is estimated that this mine will be in full production in early 1949. The New Jagersfontein diamond mine in the Orange Free State is expected to be in production in 1949.
(Counselor of Legation for Economic Affairs Charles E. Dickerson, Jr., Pretoria.)

FLUORSPAR

SOUTH WEST AFRICA.—Small quantities of fluorspar have been exported from time to time since 1926, when production first began, but the total amount has not exceeded 4,000 long tons. The mineral occurs on the farm Garub No. 83 in the Keetmanshoop district, on the farm Stinkdorn, Warmbad district, and on the farm Aukum 104, about 30 miles south of Kuibis, Bethanie district.

An extensive deposit of fluorspar reported to contain several million tons of ore is on the farm Marburg No. 1, about 12 miles northwest of Otjikango station on the Usakos-Tsumeb narrow-gage railroad, 36 miles northerly from Otjiwarango.

According to the Union Geological Survey, the deposit is in the Marburg mountain, a large hill of metamorphosed sedimentaries surrounded by granites. The fluorspar is locally associated with a very pure hematite, which occurs in steeply dipping parallel bands striking almost north and south. These bands, of which there are three, are reported to have been traced over a strike of over a mile and are individually of the order of 100 to 150 feet wide. On the southern flank of the hill one of these bands has been opened up by means of an adit driven about 150 feet in the hillside. Near the end of this adit a winze has been sunk to a depth of 100 feet. All this work has been done in massive fluorspar, which indicates the extensive nature of the body. Apart from hematite, the only other mineral present in quantity is quartz disseminated in certain sections of the ore body. The deposit is reported to average about 70 percent CaF_2. The exploration work on the deposit was done in the early 20's, and there is no record of any production. Beneficiation of the fluorspar will be handicapped by lack of water in the immediate vicinity of the deposits. The deposits are owned by the South African Iron & Steel Industrial Corp., Ltd., and by the Tsumeb Corporation, Ltd., which acquired the fluorspar holdings along with the other assets of the former Otavi Minen und Eisenbahn Gesellschaft.
(Minerals Attaché William O. Vanderburg, Pretoria.)

GRAPHITE

SOUTH WEST AFRICA.—The deposit which produces most of the graphite (flake graphite) is the Aukum mine on the farm Aukum No. 104, Bethanie district, 36 miles south of Sohakalskuppe, a siding on the railroad line between Keetmanshoop and Luderitz. The deposit is worked by the South West Graphite Mining & Refining Co., Ltd., incorporated in the Union of South Africa October 28, 1946. This company acquired the assets

of the South West Graphite Co., (Pty.) Ltd., also incorporated in the Union August 27, 1942.

All production is shipped by rail to the company's flotation plant at Madibi on the railway line between Kimberley and Mafeking, about 10 miles southwest of Mafeking, Cape Province. The Madibi plant has a capacity of 50 tons per day. The company has under construction a new plant with a capacity of 200 tons per day at Puipaardsvlei, near Krugersdorp, in the Transvaal Province.

At Aukum, the graphite outcrops on the side of a hill in granite and gneiss, capped by arkose and quartzite. The main ore body has a length of 120 feet and a maximum width of 26 feet. It has been developed by four adits to a vertical depth of 260 feet. Small lenticular bodies of graphite occur parallel to the main ore body. The ore as mined averages about 50 percent graphite in a pure state, which grade is raised by hand sorting and cobbing before being trucked to the rail for shipment to Madibi.

The principal user of the company's unrefined graphite is the South African Railways.

Large deposits of low-grade graphite also occur near Otjiwarango, but several attempts to exploit these deposits were unsuccessful because of difficulty in producing a marketable product.

(Minerals Attaché William O. Vanderburg, Pretoria.)

ICELAND SPAR

SOUTH WEST AFRICA.—Iceland spar of optical grade has been produced intermittently for a number of years in South West Africa, where it occurs in "nests" in amygdaloidal basalts in the vicinity of Mariental, in the Gibson district, and in the Rehoboth district. During World War II about 4,500 pounds of dressed crystals were purchased for export to the United States, but since 1946 there has been no output owing to lack of demand. Stored at Windhoek are more than 25,000 crystals ranging in size from 15 to 20 millimeters to 30 by 50 by 70 millimeters. These crystals have been cleaned and dressed expertly.

Although the deposits are scattered over a considerable area in both of the foregoing districts, and systematic prospecting is necessary to find the "nests" in which the calcite crystals occur, it is likely that production could be re-established if the market conditions were satisfactory.

(Minerals Attaché William O. Vanderburg, Pretoria.)

LITHIUM MINERALS

SOUTH WEST AFRICA.—Deposits of lepidolite, petalite, and amblygonite of commercial importance occur over a considerable area surrounding the Eronge Mountains.

The first discovery was made about 1930 by F. J. Jooste of Karibib, who submitted samples to the Mines Department at Windhoek from his claim near Albrechts Siding worked for cassiterite. In the last half of 1930 and the first half of 1931, a considerable number of claims were pegged, but owing to difficulties in marketing the material there was little production until several years later. Subsequently, amblygonite and petalite were found to be associated with the lepidolite in pegmatite bodies in the Karibib area. The pegmatites are unusual in the variety of lithium minerals found, which include lepidolite, petalite, amblygonite, rubellite, cookeite, zinnwaldite, and hallerite. Considered commercially, these deposits of lithium-bearing minerals are probably the most extensive in the world. The principal producing company has been the Jooste Lithium Myne (Eindoms), Beperk, which controls the most important deposits on several farms south and southeast of Karibib.

On the farm Okangava, about 18 miles south of Karibib, lepidolite, petalite, and amblygonite occur massive in a quartz blow in granite which outcrops on a small hill. The outcrop is traceable on the surface for a length of about 700 yards east and west, and the width ranges up to 50 yards.

Lepidolite, the most abundant lithium mineral, is associated with quartz. Petalite in massive form and in a fairly pure state is found alongside the lepidolite. The amblygonite, which occurs in far smaller quantities than either the lepidol-

ite or petalite, occurs as masses erratic in size and distribution within quartzose portions of the ore bodies. Masses of amblygonite up to 5 tons in weight have been found. A small quantity of beryl is also recovered in the mining of the lepidolite. The mining of the lithium minerals is from shallow open cuts, and by hand cobbing a grade of 4 percent Li_2O can be maintained for both the lepidolite and petalite. Masses of pure lepidolite up to 1,000 pounds in weight have been produced. Inadequate work has been done to ascertain the measured ore reserves but it is estimated by Mr. Jooste that the reserves are about 100,000 long tons equally divided between lepidolite and petalite. There is no doubt that the present output could be expanded considerably if market conditions warrant.

Another deposit, principally lepidolite, is also worked by the Jooste Lithium Myne about 4 miles from the deposit mentioned above.

(Minerals Attaché William O. Vanderburg, Pretoria.)

MARBLE

SOUTH WEST AFRICA.—West and northwest of Karibib (150 miles from Walvis Bay), on the Windhoek-Swakopmund-Walvis Bay railway line, marble has been quarried for building and monumental purposes. The marble occurs as banded and brecciated varieties in gray, black, red, and yellow. The deposits were first worked in 1911 by the Africa Marmor Colonial Co., which ceased operations in 1913. During the 3-year period 1911-13, the total production of marble was valued at only £2,512. A second attempt was made to work these deposits in 1925, but after a short time operations ceased. There is no indication that the attempts to work these marble deposits have been financially successful.

(Minerals Attaché William O. Vanderburg, Pretoria.)

SEMI-PRECIOUS STONES

SOUTH WEST AFRICA.—Semi-precious stones have been produced in South West Africa from the pegmatites near Rossing Mountain, Klein Spitzkop, and Donkerhoek in the Swakopmund district. For a number of years considerable quantities of tourmalines, aquamarines, rose and smoky quartz, amethyst, and topaz were sent to Europe, chiefly Germany. Recently, however, there has been little activity in the production of semi-precious stones.

Green, pink, and dark-blue tourmalines have been produced, the green variety being the most abundant. One of the interesting varieties of beryl produced in the territory is the heliodor or golden beryl. This comparatively rare stone was first discovered in South West Africa about 1912 in the vicinity of Rossing Mountain, about 30 miles northeast of Swakopmund. Because of its rarity, very little of the material has been available for cutting and mounting in jewelry. Heliodor has a peculiar greenish yellow color and compares favorably with the yellow diamond. An interesting characteristic of this stone is that it is radioactive. Although some tourmalines and aquamarines are reported to be radioactive, these stones possess this property in a smaller degree than the heliodor found in South West Africa.

(Minerals Attaché William O. Vanderburg, Pretoria.)

NEW DIAMOND FIELD DRAWS PROSPECTORS

A vast, high plateau, cut off from the outside world by the equatorial jungle of the Amazon in the south and by forbidding forest-clad mountains to the north, is being opened up for settlement as a consequence of the discovery of a rich diamond field in British Guiana.

A dispatch from Rio de Janeiro reports that Brazilian prospectors and adventurers are streaming across the border into British Guiana in the greatest diamond rush that South America has known in years.

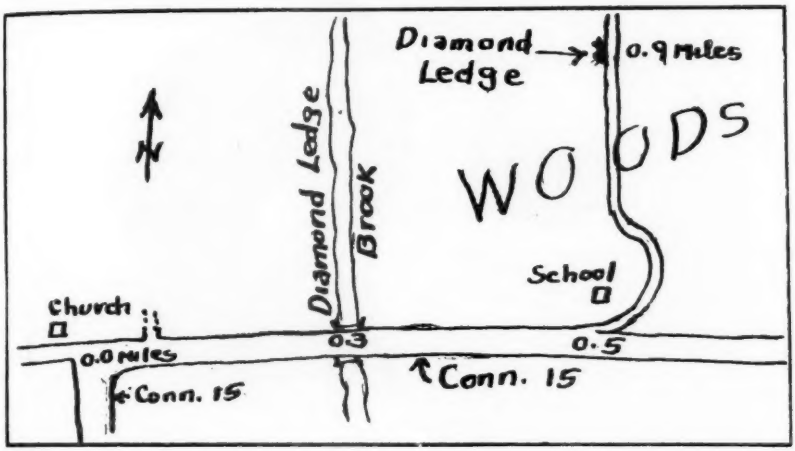
Southern Guiana plateau country, which the British government once considered for use in connection with a plan for settlement of refugees, is a prolongation of the Venezuelan llanos, or plains. No roads or navigable rivers connect the country, with the outside world, and some 700 diamond seekers are still struggling to reach it from the south".

Chicago Tribune
June 20, 1948

Editor's Note: The above item was sent in by Miss Helen Kennedy of Chicago, Ill.

DIAMOND LEDGE, WEST STAFFORD, CONN.

By PETER ZODAC, Editor
Rocks and Minerals



West Stafford is a little hamlet in northern Tolland County, in northern Connecticut. On the northern outskirts of the little community, in back of the small schoolhouse, is a wooded area. In this area is an outcrop of a very fine grained or massive brownish quartzite. This quartzite, which faces the brook in the small ravine, is known as Diamond Ledge, because of the small quartz crystals which occur in it.

Some very nice quartz crystals, mostly milky, have been found at Diamond Ledge, and one of the nicest specimens seen was presented to the writer (March 4, 1948) by Albert M. Smith, of Wallingford, Conn. It is 3 x 7 inches in size and consists of 12 large milky quartz crystals (the largest is 1½ inches in diameter and 2 inches long), and many tiny ones, on a massive milky quartz base.

A letter from Mr. Smith gave us the following information on his find:

"Last year, four of us Wallingford boys went to the West Stafford locality where we found a large rock with a deep crack in it. With the aid of a crowbar and sledge hammers we pried it open and to our surprise found a cavity inside that was just full of these crystals."

Other minerals found at the locality are limonite (brown stains on quartz which spoils many crystals), muscovite as tiny flakes in the quartzite, and tiny rock crystals in quartz veins.

Fishing for gold in Alaska

An interesting letter to the Editor of *Rocks and Minerals* recently arrived from Edgar C. Stinger, of Carthage, Ind. Part of it reads as follows:

"As you know, I was on the U.S.A.T. Taku, for 47 months, Sept. 5, 1941, to Aug. 8, 1945. During September, 1941, I made my first trip to Alaska, to Nome. Nome Beach was a great gold producer but all the gold there was not above high tide marks.

"I had been told that there was a lot of gold at the bottom of the bay where we were anchored in Nome harbor. As we were to be anchored in the harbor for 7 days, I determined to try my hand at fishing for some of the gold. Attaching a hollow lead to a hand line (with beeswax in the hollow), I began fishing from the Taku. In one hour I picked up 12 flakes of gold, stuck to the beeswax! Can any of your readers better this?"

WHO HAS THE LARGEST FACETED GEM?

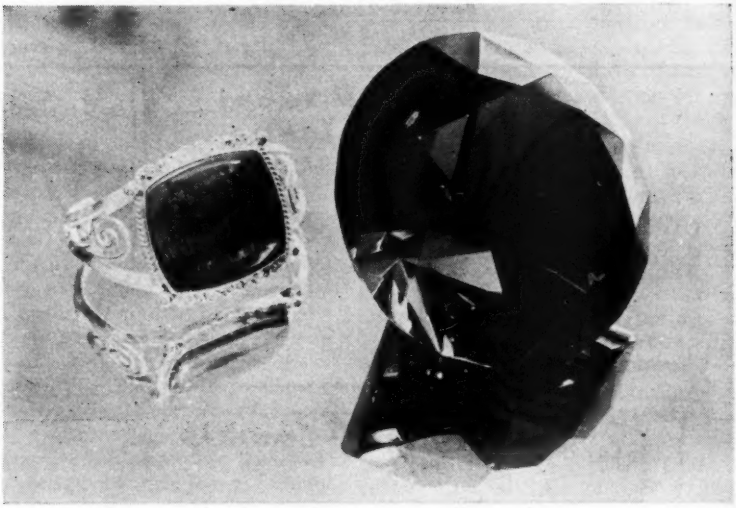


Fig. 1. Mr. Rouse's fine large gem (right) compared with a lady's bracelet.

A letter has recently been received from Harold B. Rouse, P. O. Box 6, Yucaipa, Calif., bringing up a most interesting point. Who has the largest faceted gem in existence? If anyone can better Mr. Rouse's specimen, we would be delighted to hear about it and especially so if some notes were sent for printing. Below is Mr. Rouse's letter:

"I would like to know who has the

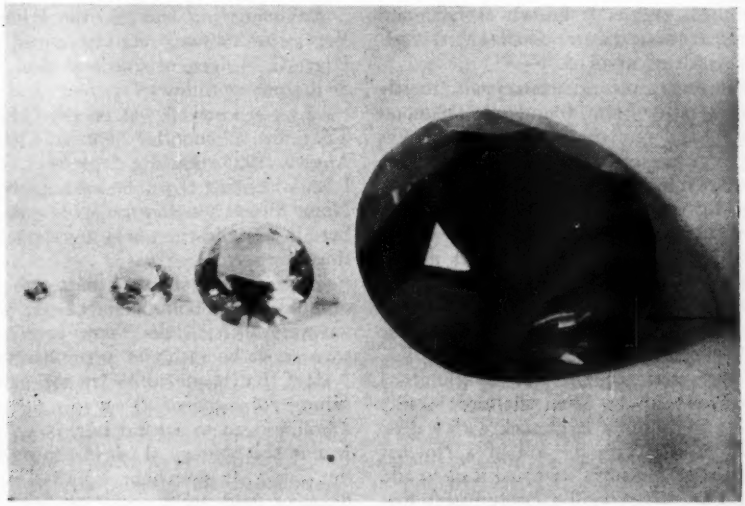


Fig. 2. Another view of the large gem.

largest, standard diamond cut, genuine gemstone and how large it might be?

"I submit herewith pictures of the one I have just cut. Picture No. 1 shows the gem on a mirror with a good size lady's bracelet for comparison. Picture No. 2 shows the gem with other stones, the next in size is a 130 carat rock crystal.

"The big stone is a deep "golden smoky" quartz from Brazil—flawless—3 inches in diameter, weighs 1 lb. or 2264 carats.

"I should like to know if there is a larger one in existence, if it is possible to find out.

"Have had a lot of fun showing it among the lapidaries and interested people out here."

(Mr. Rouse's letter was dated March 22nd, 1948, but due to an oversight it was not printed sooner.)

AN IDEA FOR CLUB SECRETARIES

I have hit upon an idea which I think may be helpful to other Club Secretaries:

Providing myself with a supply of ordinary 3 x 5" index cards, I opened the various mineral magazines (*Rocks and Minerals, Desert,* the *Mineralogist* and the *Lapidary Journal*) to the beginning of the "News of Societies." On the top line of each card, I typed the location of individual society—state first, then city or county, as case might be. On the 2nd line, the name of the society. Following lines are devoted to meeting place, date and time, with special note if the "Welcome" mat is out. The 1948 officers with addresses, as given, follow. If a publication is named, this is also listed on face of card.

On the back of the card are the briefest of resumes of club activities, and magazine source of information (name, date, page) listed, so it can be easily referred to for further details.

These cards are filed alphabetically as written: state, city, name of organization.

Separate cards are kept of federated organizations, and all pertinent data; and these are filed alphabetically according to NAME OF FEDERATION. These are filed under division headed FEDERATED ORGANIZATIONS.

Another division is headed "MINERAL SHOWS," and these cards are filed according to DATE and location. Source of material, whether advertising or magazine article giving detailed information, is added.

Of course this is a great deal of work, for in few individual write-ups does one find all the basic information, but I think it is well worth the effort, for:

When one of our CLUB members is preparing to start on his vacation, all he has to do is get in touch with me, and the information is immediately available as to what club meetings he may be able to attend, and which shows he may be able to see.

If one moves into a strange community we can readily put him in touch with other rockhounds.

Furthermore, any information that is desired about any organization or exhibition at any time is accessible, in so far as I have been able to obtain it from sources listed. If the time comes that we start publishing our own "Bulletin," we will be able to effect an exchange with other organizations with a minimum of trouble.

So far the information I have is far from complete, of course, but I am adding to it with each issue of every magazine, and when our secretary steps into office next year, he will find the foundation laid for him.

I will be glad to help others in any way I can! And if Club Secretaries would care to drop me an information card, direct, I'd be delighted. Believe this is something that could be worked up for mutual benefit of all societies.

Mrs. F. Rankin, Secretary
Feather River Gem & Mineral Society
Route 1, Box 131A
Oroville, California

A NEW MICRO-MOUNT METHOD

By DR. WM. S. NEWCOMET

The box-mount has become popular for the reason that it is compact, therefore economizes space in these days of limited house room. In reality it gives almost the same opportunity for study as the large museum pieces. Another point in favor of the box-mount is the specimens are relatively free from dust; and while they are not so well protected as those mounted in cells upon a glass slide, covered by a thin cover glass and sealed with varnish, the objection to this method, which was in favor about seventy-five years ago, is that the cover glass becomes fogged. In an article appearing in *Rocks and Minerals*, July, 1942, pp 232, this was mentioned and the old cover glasses were removed and replaced by new ones; since then some have shown this same film and also a number of them show small particles of the mineral, possibly due to some electromagnetic effect. Therefore the box-mount is to be preferred.

At times there is a specimen where it is difficult to decide which side to expose, when mounted. It is suggested that the following method might be employed. The bottom of the box should be removed and replaced by another lid, then the specimen is held in the body of the box by four fine threads, determined by the size and character of the specimen.

The box is prepared by first placing the two lower threads in position and then stiffening them with a colorless cement, which prevents sagging; when this is dry the specimen is placed and the upper threads are put in and cemented. After drying the specimen should be perfectly rigid and permit examination from either the top or the bottom as well as from different angles. Furthermore it not only affords examination by reflected light but also by direct illumination, and even with nicols.

Instead of using threads to support the mineral in the box a piece of cardboard can be glued to the inside and blackened. When dry the specimen is mounted with cement. Before inserting the diaphragm in the box, the opening should be made the size and shape of the mineral.

It will be found that either of these methods is useful and widens the scope of the examination.

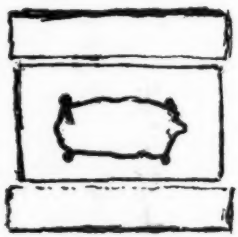


Fig. 1. Shows box in the vertical position with the threads in position.

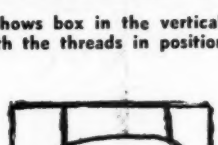


Fig. 2. Shows box in the horizontal position.

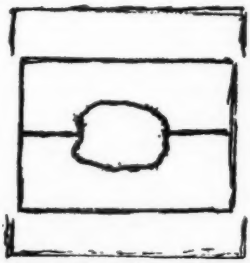


Fig. 3. Box with diaphragm in the vertical position.

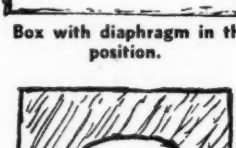
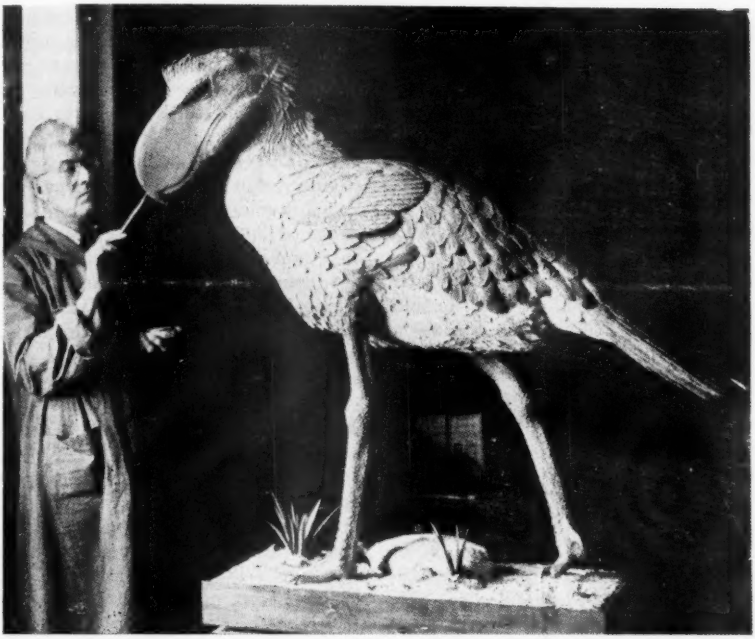


Fig. 4. Box in the horizontal position.

Terror Bird of Eleven Million Years Ago Restored



Staff Taxidermist Leon L. Pray puts the finishing touches on the life-size restoration of the "Terror Bird". The model is now on exhibition in Hall 21, at the Chicago Natural History Museum, Chicago, Illinois.

A life-size restoration of Mesembriornis, giant "Terror Bird" that lived between 8 and 20 million years ago, in South America long before the advent of man, has been completed at Chicago Natural History Museum and was placed on exhibition Wednesday (April 21).

This creature, whose appearance was like that of some of the horrible and menacing things one encounters in a nightmare, was truly a nightmare to the contemporary animal life in its day, according to Emmet R. Blake, associate curator of birds. The bird had a terrifying mien with its powerful curved claws and its huge beak, which equipped it to tear apart, and crush and cut the bones of mammals, lizards, snakes, and other animals upon which it preyed voraciously.

Its nearest living relatives are the little known much smaller birds of the pampas of Argentina and Brazil, the cariama, and the chunga. The prehistoric bird was flightless; the modern relatives, which Mr. Blake has hunted, are able to fly a little.

The restoration, made in colors based on those of the living relatives, is the work of Leon L. Pray, staff taxidermist. The modeling was done by first making an artificial skeleton and then employing sculptural methods.

Volcano Smoke Is Molten Pumice

The smoke of a volcano is really pumice, a grayish rock blown so fine by steam that when it settles it has the appearance of ashes.

Masses of solid pumice are full of cavities and can float on water. Nice specimens of pumice are found in the volcanic regions of the world.

— MR. PARKER —

When I was working for the Titanium Alloy Co. in the late thirties I heard about a rutile deposit in southwestern Texas. The owner was a James H. Parker of El Paso. I became actively interested in the deposit and Mr. Parker and I became friends.

Mr. Parker was elderly when I came to know him, but only so far as years might claim. And it's true he was a bit slow in climbing the cliffs of Rutile Hill. But his mind was alert and keen and his outlook vigorous and forward-looking. He was full of warm friendliness, yet behind it lay impeccable dignity and old-world courtesy seldom found any more. Behind that again, underneath the spectacles if you really cared to look for it, there was apt to be a twinkle of shy humor. Careful in his dress, as neat away from the haunts of men as among them, he was a gentleman of the old school if there ever was one.

Over several years we had occasion to spend much time in one another's company. We lived in a little hotel in a drab little town overlooking the broad, dusty plains of Texas. Early each morning we climbed the same steep hill, rain or shine. There were forty years between us, but no gap at all when it came to matters of philosophy, of life in general and how the world seemed. Once I remember we talked about death; Mr. Parker thrust it from him, almost contemptuously, for it did not enter into his scheme of things. He met life as he found it, straightforwardly and without inhibitions; I guess that's why he never seemed old to any of us who knew him.

He had two loves, mining and minerals. A true appreciation for both, oddly enough, seems genuinely rare in the same person. From the time his pioneer father gave up managing the Overland Stage along the Santa Fe Trail to tackle gold mining in Texas and New Mexico, the son had digging and the clang of metal on rock and the dark, hidden passageways under the earth firmly in his blood. Out of one fabulous pocket in one of his father's New Mexico mines there had come into his possession a handful of crystallized golds, perfectly exquisite for their beauty, wholly unique in their manner of growth; I wonder whether those specimens did not have a lot to do with making a mineral collector out of a miner.

Mr. Parker became a successful mining engineer, but he never lost any of his love for minerals. His collection always remained small and choice, not for lack of opportunity but because of an inherent fastidiousness and a very discerning eye. Mexico, his special field of mining activity, was unusually well represented. He was the first to bring out some of the outstanding Ahumada lead minerals and, among other finds, was the discoverer of the famous white garnets of northern Chihuahua.

Mr. Parker did not aim to get his name on the front pages; his tastes were modest and he was satisfied with being what he was, a good, dependable mining engineer. Without secret longings for big deals and vast operations he found more time to enjoy life as it came to him, and that capability he never lost.

Just a short time ago I had a letter from Mrs. Parker. I knew what was inside before I opened it. On April 29th, at the age of 79, with quietness and, I know, serenity, a gentleman of the old school had passed away. Now let's see, what can we tell here about his history, his achievements; that's what people expect to find in an obituary. So I found myself writing Mrs. Parker for dates, making up sentences such as, "Such-and-such a mine was operated successfully at such-and-such a time." Most of that I soon discarded for it did not begin to say what I was looking for, a picture of who this man was—not my view of him, or anybody else's, or data from a *Who's Who* —but a likeness of the true person underneath the hand who held the Brunton campass, inside the neat clothes behind the rimless spectacles.

I have found what I sought not in deeds, nor in historic facts, but in a few simple recollections of how a person walked and talked, how he looked at one, how he smiled and shook hands. For this is what makes up a man, not the factual material which, like most motion pictures, builds up a sense of wholly unreal perspective. The real Mr. Parker was not in deeds, but was in the person I saw walking down the street, heard talking in the dark on a hotel porch. He was in the little, quiet things which go to make up all our lives. And if we look sharply enough, we can find the true measure of a man reflected in every unobtrusive act and word. That was Mr. Parker's philosophy, I think, to live simply and modestly and do the job that came to him as well as he could. And he was satisfied with just that. He somehow removed himself from the consuming pace and excitement of modern life; that's why I particularly think of him as old-fashioned I suppose. Because he did not make life complicated and boisterous for himself, it was full of little things that were good. Perhaps these little things only seem satisfying and good when we forget the ambitions, the achievements, the big and exciting preoccupations of life. Perhaps the signs of real achievement in any person's life are no more than those same little qualities we make manifest to others as we pass along, thus courtesy, modesty, dignity, kindly humor. For that is how we, you and I and Mr. Parker, meet life, irrespective of what others think about us afterward in terms of irrefutable facts, of things accomplished, of success and failure, of time of arrival and departure. Mr. Parker's way, and his message, were to be satisfied with what you have and what you are, to do your best in the little things which confront you day by day. And then when the final stagecoach stops at the door, there is no bustle or confusion, there are no regrets, no important things left undone, there is no great sense of sadness. It is part of the day's work, and in quietness and serenity may we meet it all when it comes our way.

Arthur Montgomery

Perlite

Perlite is a variety of obsidian. Obsidian and pumice are acidic volcanic glasses produced from a granite magma during volcanic eruption. These types of rock are complex amorphous silicates of aluminum, sodium, and potassium, with minor amounts of other constituents. They contain 65% to 75% silica; 9% to 20% alumina; less than 8% sodium and potassium oxides; less than 3% calcium and magnesium oxides; less than 3% iron oxide; and between 0.1% and 6% combined water (ignition loss). Some varieties of obsidian, notably the perlitic variety (perlite), will expand up to twenty times volumetrically upon exposure to heat within a range of 1400°F to 2500°F. This property of expansion into a glass foam or synthetic pumice, many properties of which can be made to vary at the will of the processor, makes expanded perlite a material of great potential industrial value.

Very large deposits of the obsidian family of rocks are found in all of the western states. In California, deposits of perlite and other types of obsidian are known in Siskiyou, Modoc, and Shasta counties in the northern part of the state; Lake, Napa, and Sonoma counties in the central part; and Mono, Inyo, Kern, San Bernardino, Riverside, Imperial, and San Diego counties in the southern part. Many of these known deposits are close to existing railway lines and paved highways, and within a few hundred miles of large Pacific Coast consuming centers. (Min. Inf. Service, April 1, 1948, Calif. State Division of Mines.)

World's Largest Flesh-Eating Animal

The largest flesh-eating animal that ever lived upon the earth was Tyrannosaurus Rex, which means "King of the tyrant lizards." It stood 20 feet in height and had a length of 45 feet, including its tail. This huge animal populated North America during the Cretaceous period, about 70,000,000 years ago.

GRIQUALAND WEST CONTRIBUTES MANGANESE TO AMERICAN DEFENCE RESERVES

By ALMERO DE VILLIERS

South Africa is listed as an important source of metals required for the defence of the United States, which seems to be creating a large reserve for any future war, no matter how protracted.

The manganese ore of Postmasburg has been in special demand. Manganese is indispensable for the production of iron and steel. In 1929, when production began near Postmasburg, the United States bought 550 tons; in 1938 the figure was increased to 500,000 tons, and in 1947 it had risen to 1,500,000 tons.

South African manganese ore does not disintegrate easily and is of a high grade. If the ore became friable or crumbled in handling or in transit it would never reach America in usable condition; but the Postmasburg manganese is hard and rock-like, and no amount of loading and off-loading damages it. It contains very few impurities. Analyses show that the phosphorus content is low and varies from 0.02 per cent to about 0.15 per cent. The total of manganese plus iron is consistent and varies from 56 per cent to 60 per cent. The chief impurity is silica; but even this is negligible as it never exceeds eight per cent.

Vast deposits of manganese ore are found in the Postmasburg area. They stretch from the village for about 23 miles to Lohathla, where the largest mines are situated. A recent geological survey places the reserves of ore at many millions of tons; they are virtually inexhaustible. Extensive deposits of very high grade iron ore have also been found near the manganese, which is important for South Africa's own expanding steel industry.

The possibility of establishing iron and steel works on the banks of the Vaal near Barkly West has been investigated. The works would be near the manganese and iron of Postmasburg and water would be drawn from the river. The only drawback would be transportation of coal from the Vierfontein collieries about 200 miles away.

The discovery and surveying of the peculiar and extremely rich manganifeous "Black Rock," about a 100 miles north of Postmasburg, is the most recent development in manganese mining in Griqualand West. A geological report says: "The rock projects 30 or 40 feet above the surface of the Kalahari sand and is exposed for a distance of about 600 yards. There is a considerable quantity of saleable ore present." Geologists maintain that this deposit contains the richest manganese ore in the world.

A factor influencing American and other foreign buyers of South African manganese is the low production cost. Mining costs amount to only 5s. a ton, and when the ore has been loaded on railway trucks at Postmasburg total working costs vary from between 7s. to 12s. a short ton.

(The ore in the Postmasburg area consists of a mixture of two or more of the following manganese oxides, braunite, manganite, and sitaparite, together with psilomelane.)

"The Star"
Johannesburg, Transvaal,
June 8, 1948

Rocks and Minerals is grateful to Ernest M. Skea, Pilgrims Rest, Transvaal, South Africa, for the above article which he clipped from *The Star*, a Johannesburg daily newspaper, and air mailed to us. We are very sure the article will prove of considerable interest to our readers and for this reason it is reprinted.—The Editor.

Master Key to Mineralogy!

Editor R. & M.:

Just a few lines to let you know I am receiving *Rocks and Minerals* every month, find it very instructive, and I am more than pleased. I call it the "Master Key to Mineralogy."

I have written to many dealers, purchasing many minerals, books, etc., as I am intensely interested in mineralogy.

Valmore Corriveau
Manville, R. I.

April 13, 1948

THE MICRO MOUNTER

Conducted by Leo N. Yedlin, 557 W. Penn St., Long Beach, N. Y.

Well, this is column 2 of the department of small but perfect specimens. Several collectors have requested some sort of directory of people who specialize in this type of mineralogy. We think it's a good idea, and so does the editor of *Rocks and Minerals*. We do have in our files the names of about 50 men and women addicted to the sport, and we'd like to have as complete a list as possible. It is requested, then, that if you'd like to be so tabulated, and known to each other, send your name, size of collection, specialties, if any, and type of microscope used to the conductor of this page. Shortly the list will be published, and new additions made periodically.

We are in receipt of some unique specimens. David M. Seaman, of Pittsburgh, Pa., has discovered some fine specimens of polymorphous wurtzite. The crystals are hemi-morphic, and in this respect resemble zincite. The material was found in cracks in clay-ironstone nodules, associated with sphalerite and barite. The specimens are sharp and brilliant, and exhibit 2 new forms. They are described in the April, 1948, issue of Carnegie Magazine published by the Carnegie Institute of Pittsburgh.

Also received from Mr. Seaman was a group of micro-mounts (Suppose we use the symbol m/ms from now on.) from the collection of W. W. Jefferis. His was one of the finest private collections of cabinet and miniature specimens. So fine, that Andrew Carnegie purchased the cabinet and presented it to the Carnegie Museum, where it now reposes. Jefferis was a discriminating collector. His material was gathered prior to 1905 and still ranks with the best. Included in the group were several boxed mounts bearing labels "G. G. Rakestraw" and "G. W. F." (George W. Fiss). These gentlemen were probably the first in the U. S. to use the now-standard boxed mount. The specimens were welcome historically as well as scientifically.

The techniques displayed by these old-time m/m fanciers are of interest. Some of the specimens were mounted with colored cement—either shellac or sealing wax—with the result that a flash of color comes thru and is disconcerting to the examiner. Several of the specimens were ringed with brass collars, which were fitted over the corks as a frame. Neat, but under the concentrated light needed for study, the brass gives an unreal color to the whole. The best bet is still a dull black interior for the box, a black coated cork, and transparent cement. And don't use so much glue that it runs from beneath the specimen and causes glare.

J. C. Boyle of Philadelphia and New York is an ardent collector. Many of his specimens are from the happy hunting grounds of famous localities in Chester Co., Pa. He tells of a group that met periodically, brought specimens to "round table" meetings, broke them up and passed them around. Everybody got a choice piece and had a lot of fun. A wonderful way to build. There should be more of such.

Elsewhere in this issue is a short article by Dr. Wm. S. Newcomet, who was a member of the same group as Boyle in Philadelphia. His ardor for m/ms is still undimmed after all these years, and he is still experimenting with new ideas and improvements. His article solves a problem that's had many of us at a loss.

The problem of micro-mount box holders has been solved in a number of ways. While it is usually the custom to manipulate the mount by hand, observing quickly many surfaces, this method is practicable only where low power and great depth of focus are available. Where a monocular 'scope is used, where depth of field is small, where it is desired to study an individual crystal, or where a number of observers are to view the mount, then some method must be devised

to orient and hold the specimen in the most advantageous position.

The late John A. Grenzig constructed such a jig, and a number of other methods have been developed, for single mounts and for as many as 80. Mr. Grenzig took a steel ball, about 1½" in diameter, ground off about 1/3d of the sphere, soldered a brass "U" section 1¼" wide to it, and a narrow thin brass sheet to one end of the "U", permitting various sized boxes to be used. The ball fitted nicely into the hole on the stage of most microscopes, and when there was no stage a piece of 1" wood, 2" x 3" was drilled with a ¾" hole, placed on the table under the objective and the ball set into the hole. This permitted the mount to be rotated in any direction.

Another method is to pour moulten lead into a rounded mould, inserting a wet micro-box into the melt before it cools. This is simple, but has the disadvantage of taking only 1 size of box.

Jay T. Fox prefers to select several dozen mounts, set them up on a revolving stage (Your wife's "lazy Susan" is ideal.) thus saving time and trouble. For a further and detailed description see *Rocks and Minerals,* December, 1940. (Micro Mineral Mounts.)

James Taylor of Glen Ridge, N. J., in Feb., 1948, issue of *Rocks and Minerals* (page 118) contributes a novel trick. He eliminates the need for paper boxes entirely, and yet mounts 80 specimens in a combination viewer and cabinet. The specimens are mounted on the surfaces of a revolving drum, inside a small cabinet, and are manipulated by means of a thumb screw outside the device. The apparatus is set under the objective, focused on 1 mineral, and then 4 or 6 are seen with a mere flick of the wrist. The box is then moved to the next series, and again simple turning brings new jewels to view. This permits mounting and storing minerals in series—ie., elements, locality specimens, copper minerals, blue minerals or any type grouping desired.

A modification of the latter system would be to drill the drums with ¼" holes, mount the specimens on short pieces of ¼" dowel rods, and insert in the drilled holes. This would permit substitution and rearrangement.

Let's hear about other devices.

THE AMATEUR LAPIDARY

A QUESTION ABOUT TECHNIQUE

DR. C. H. BARLOW
Ministry of Public Health, Cairo—Egypt

I wonder if the following technique is a common one or whether it has ever been employed in lapidary practice? It would be a pleasure to hear from interested readers.

Recently, in cutting a small agate pebble, the results were far from satisfactory because the agate was so dark that it was unsuitable for a ring set and yet, when held up to the light, it showed good banding and color. The cut was a cabochon of the following shape:— See Fig. 1.

It looked almost like a bit of brown black porphyry. How could light be let into the stone to an extent great enough to show its pattern and color? It occurred to me to cut away the body of the stone from behind, which was done and the results were most gratifying. From a dull, lifeless stone it became light and lively, showing good color and banding.

The cut was made by the use of mounted "Crystolon" points, grain 100, rotated in a drill chuck at 1400 rpm. Polishing was done with "Crystolon" grain 600 on a short piece of round leather belting, ½ inches in diameter fol-

Fig. 1. Agate cabochons.

lowed by tin oxide on an orange stick rotated in a drill-chuck. The interior polish is what gives the light and life to the stone. Mounted in gold the set is really lovely. Thin slices of agate yield up their planes of crystallization and agates, which otherwise are commonplace, become unusual when treated in this hollow-ground cabochon style.

Internal faceting is accomplished with excellent results by the use of graded mounted heads of "Crystolon" or iron heads onto which "Crystolon" and water are fed during the grinding. I prefer the latter because they hold their edges longer and cut faster even though they are messier.

The illustrated equipment is effective. A jig is made, to hold the stone, which can be varied as to shape. It is little more than a dop-stick with a hole the exact size of the smallest drill head into which the drill is set for centering before each operation. The smallest drill hole in the stone itself is used for centering each time after the first drilling. Larger drill-heads are used for each successive facet. The angles of the facets can be changed by shaping the cutting pace of the drill. Each facet is a circular rim. The effect, in a nearly transparent agate, of this style of faceting is delighting. The rim of the cabochon gives a bright halo at its base which is pleasing.

Cuts can be made also radiating from the inner roof of the stone to its rim or base by using small copper disks and abrasive.

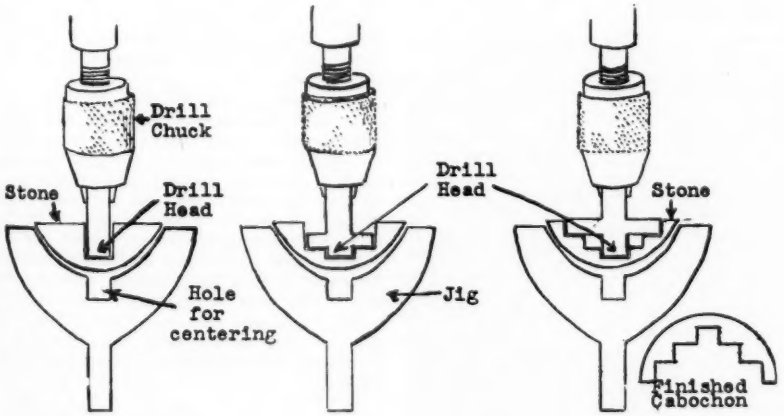


Fig. 2. Steps in the process of internal faceting of an opaque agate.

CLUB AND SOCIETY NOTES

ATTENTION SECRETARIES—If you want your reports to appear in the Sept. issue, they must reach us by Aug. 10th—the Editor.

Pomona Valley Mineral Club

The Pomona Valley Mineral Club held its April meeting in the Chemistry Building of Pomona College. Election of officers for the coming year was held. The new officers are: Mr. Weist, president; Mr. Smith, vice-president; Mrs. Boileau, secretary; Mr. Grover, treasurer; and Miss Dow, director. Miss Saylor was appointed program chairman.

Guests for the evening were members of the Pomona Adult Education class in Mineralogy. Mr. Frank Rentchler introduced the speaker for the evening, Mr. Jerry Laudermilk, whose subject was "Common Minerals of the Pomona Area". He described the minerals of San Antonio and Cascade Canyons. He told of the "pools of ink" in Cascade Canyon, due to acid-bearing rocks being in contact with water-bearing tannic acid. He demonstrated the process by showng a jar full of water in which oak leaves had been soaked, and made a fair grade of ink by dropping a piece of acid-bearing rock into it. He told of the Pisgah Crater and of the strange property of magnetism displayed by some of the volcanic bombs. He referred to himself as a janitor who picked up the tag ends left by other geologists and unconnected bits of information and tried to piece them together.

After the meeting, Mr. Laudermilk showed the club and their guests through the college museum and described the displays, some of which he had collected and arranged.

For the May meeting, Mr. Don Dressen was the speaker. His subject was "Geophysical Oil Prospecting in South America". Mr. Dressen began his talk by describing the instruments used in this work. A light charge of dynamite is set off a few feet underground. The shock of the explosion passes downward and is reflected upward by the various formations of rocks, to be picked up by the recording instruments. These vibrations are recorded on a tape and are transcribed by specialists who are able to make accurate contour maps of the underground formations.

Mr. Dressen told of the difficulties encountered in working in foreign countries. They have to estimate their needs in supplies and equipment a year ahead. In many places equipment had to be packed in by mules many months ahead of the actual work, and at least in one instance he told of, took at least six months to get the equipment out again. He told of the hostile natives he and his companions had encountered in the Venezuelan jungles. They accounted for at least four of his companions' lives, for the crews ignored the crude warnings put up across roads and trails.

At the conclusion of his talk, Mr. Dressen showed very interesting colored movies of his travels and the actual operations he had described.

After Mr. Dressen's lecture, Mr. Kroger, the outgoing president, made a few remarks thanking the club for its cooperation during the past year. He introduced all of the new officers, and then turned the gavel over to Mr. Weist, the incoming president, who brought the meeting to a close.

The June meeting of the Pomona Valley Mineral Club was held in the Chemistry Building of Pomona College with Wendell Stewart as guest speaker, whose topic was "Mines and Minerals in Mexico". Mr. Stewart had some very colorful and interesting kodachromes which he and Earl Calvert took on their trip into the Mexican interior. Some of them showed the mines and cities they visited and some were excellent slides of the various minerals they found, which were beautifully photographed on striking backgrounds. Mr. Stewart accompanied the showing of the slides with graphic and sometimes humorous comments about the mines, the country, and the people. After showing his pictures, he described the large array of specimens and cut stones he had brought. Mexico has excellent selenite crystals, some 14 inches long, with movable bubbles, and he had a number of these crystals in his display. There were some exceptionally fine wulfenite crystals, both cubic and tabular; one tabular specimen in particular having crystals about 1 x 1 x ¼inch. He also showed a large number of Mexican opals which were cut and polished by the natives. They have only crude equipment to use, but do very fine work.

The Club enjoyed Mr. Stewarts slides, lecture, and collection, and hope he will pay a return visit.

We also had as guests Mr. Rush and Mr. Hymes from the Long Beach Mineralogical Society. Mr. Rush spoke on the coming 9th annual convention of mineralogical societies to be held in Long Beach July 16, 17, and 18. He described the various exhibits which will be there, as well as giving the rules for societies who wish to display their minerals.

The Club will hold their annual picnic in July in place of a regular meeting. A trip to the Cal Tech Museum was planned for August.

Verna N. Weist
Publicity Chairman
322A E. B St.,
Ontario, Calif.

Mineralogical Society of So. Californie

Dr. Mark C. Bandy, Director of Research of the Gemological Institute of America, spoke on "The Mineralogy of Llallagua, Bolivia" at the May 10th meeting of the Mineralogical Society of Southern California.

Dr. Bandy spent a number of years in Bolivia and particularly at the Llallagua deposit which is the largest tin mine in the world. Some 300,000 tons of tin valued at half a billion dollars have come from this locality.

Early explorers in this region were interested primarily in gold and silver. The Llallagua deposits were worked first as silver mines and the district was settled by people who traded in gold and silver. This was during the early decades of the 19th century. These early days of mining were hard and often cruel. From 1840-1870 was known as the dark age in mining. As late as 1929 one mine in Bolivia still worked 36 hour shifts, and when a mining company tried to change to 12 hour shifts the miners struck complaining that they were good miners and when they went to work they wanted to work.

It was the first world war that gave impetus to the mining of tin. The ownership of the Llallagua deposits reads like a romantic story of rags to riches. A twenty year old youth inherited a claim and became in 40 years one of the 10 wealthiest men in the world. He controlled about one-half of the Llallagua deposits and in 1940 was able to absorb the Chilian Company which owned the other deposits.

The ore is all contained in an igneous plug. An inland sea laid down thick deposits of shale. Then came the uplift of the Andes range. At Llallagua thrusting from the east produced an anticline. During the fracturing of this anticline a volcanic blowout occurred. The neck of the volcano was finally plugged up and activity stopped. Diorite was then intruded and solutions came in which reworked the volcanic ash. The porous ash offered a ready field for attack by these solutions. The round volcanic plug was then deformed by pressure so that it was elongated to eliptical form. In this deformation it was faulted and fractured—tension cracks opened. Igneous rocks were thus intruded in open fissures with almost no preheating since it was close to the surface. The hot solutions came up into open veins where sudden cooling and lack of pressure resulted in the unusual character of the deposit. Crystals could grow freely in the open veins.

In the Llallagua deposits 46 main veins are worked and 1300 branch veins. The richest vein worked is 6 - 8 feet wide and half a mile long. The ore from it runs 40 percent tin. A great number of minerals were formed here —98 minerals have been identified to date without microscopic examination. There are 125 miles of workings in the mine and 66 levels.

Dr. Bandy's description of the minerals found in the Llallagua field and the stories of his collecting there gave every collector in his audience the urge to be South America bound. Orthoclase and plagioclase crystals were found in the ash. Cordierite crystals up to two inches long and one inch in diameter popped out of the rocks when an energetic collector hammered on them. In the ash on the surface blue cordierite grains were found. Much tourmaline was found but never in large crystals—vugs lined with tourmaline and quartz. Japanese twins of quartz were found. Bismuthinite formed on top of the quartz and some native bismuth but cassiterite coverd these. Wolframite was deposited through and on top of the cassiterite. Rhodochrosite was found and pyrite in unusual forms—octahedrons—some highly modified. Associated with the pyrite were found stannite crystals up to one inch—bright, highly twinned, and modified. Wurtzite crystals, some half an inch across were collected with franckeite and the brilliant, flexible, tinfoil like crystals of cylndrite. Arsenopyrite in small bright crystals were found though these were not common at Llallagua. Greenockite, stibnite, tetrahedrite, and calcite in some outstandng crystal forms were found. Beautiful specimens of apatite were collected. Vivianite in large crystals some with phantom, green and yellow wavellite growing on quartz, metavauxite, paravauxite and vauxite, childrenite.

And so it went with each specimen described seemingly more exciting than the one before it. Dr. Bandy predicts that when the final story of Llallagua is told some 150 or more minerals will be known. There are still many that have not yet been identified.

Pauline Saylor
Covina, Calif.

South Bay Lapidary Society

A new lapidary society called the "South Bay Lapidary Society" has just been formed to serve the South Bay communities of suburban Los Angeles, Calif., including Manhattan Beach, Hermosa Beach, Redondo Beach, Torrance, Hawthorne, Inglewood, and El Segundo. The need for such a society in this area has been felt for some time and the new group is getting off to a flying start.

Officers for the first year are:—

DeWitte Hagar, Manhattan Beach,—President; Ellen Barrett, Redondo Beach,—Vice-President; Chet Page, Hermosa Beach,—Secretary; Mrs. George Curtis, Hermosa Beach,—Treasurer.

An important feature in the set-up of the new Society is the minimization of business details to allow more time in meetings for the discussion of stones and lapidary procedure. Mr. Hagar is a Past President of the Los Angeles Lapidary Society.

Cincinnati Mineral Society

A regular meeting of the Society was held on Wed., May 26, 1948, at the Cincinnati Museum of Natural History, Cincinnati, Ohio. The meeting was opened by our President, Mr. Sarles, at 8 p.m. Mr. G. F. Hubing was introduced as a guest of Mr. Wells. Mr. Hubing is the owner of several gravel pits locally and should prove a valuable member.

The following members were appointed to serve on the program committee, Chairman, Mr. James Clements, Mr. Wells, and Mr. Bradtmueller. For the committee on field trips, the following were appointed, Chairman, Mr. C. L. Gschwind, Miss Rose Ann Dehoney, and Mr. Frank Atkins. The above appointments are to be supplemented by two additional members to each group to be chosen by the chairmen.

A number of suggestions for possible field trips were outlined for consideration of the field trip committee, most outstanding being as follows:

1. A trip along Ohio Route 125.
2. A trip into Kentucky to include quarries at Georgetown, Lexington, then to Scott and Franklin Counties, into Stamping Ground and Frankfort areas.
3. A trip into Indiana, reaching to the Mitchell and Bedford areas, and including such spots as Scottsburg, Huron, Dover Hill, and Shoals.

It was decided to spend a portion of each meeting to discussion of an interesting trip or specimen any member may have encountered in the interval between meetings. In line with this meeting, Mr. and Mrs. Bradtmueller related having visited the Hocking Valley State Parks notable for formations in sandstone and quartz pebble conglomerate. Mr. Sarles attended the Annual Meeting of the Ohio Academy of Science at Toledo, Ohio. This group went on a trip conducted by Dr. Carver, of Ohio State University, to the silica-shale region near Toledo. Mr. Sarles collected some excellent fossils coated with pyrite, giving them the appearance of being gold plated. He also obtained some gypsum concretions and selenite crystals in massive gypsum.

Mr. Sarles also reported that on a recent trip to Copperas Mt. he found a piece of a fossil log on a piece of shale in coal, the veining in the material was barite.

A motion was passed that the Society as a whole join the Natural History Museum Association as a contributing member.

As this evening is one designated for lapidary work, members were advised that material for this work could be purchased from the Museum at a nominal fee, but that it was desirable for members to provide their own material. An increasing number of the members are participating in the cutting and polishing and a number of fine stones are being finished.

A report on the progress of the committee to develope a system of cataloging collecting areas revealed a form has been adopted and the forms and accompanying key would be available at the next meeting if printing of same can be arranged in time.

The remainder of the meeting was devoted to cutting and polishing, and general rockhound gossip by those not engaged in the polishing.

Charles L. Gschwind
6931 Diana Drive,
Cincinnati 24, Ohio

East Bay Mineral Society

Climaxing an enthusiastic and successful year, a hundred twenty members and guests of the East Bay Mineral Society gathered for the final meeting of the season at the Park Boulevard club house on Sunday evening, June 6th, to enjoy a fine barbecue dinner.

The following new officers were installed for the coming year beginning in September after the summer vacation:

Millard V. Moore, President; Ernest M. Stone, Vice-President; J. J. Mallon, Secretary; Gerould H. Smith, Treasurer; Dr. David F. Houston, Director.

After the introduction of guests from Salinas, Modesto, Sacramento, San Jose, Stockton, San Francisco and other neighbor Mineral Societies, and congratulatory speeches, all adjourned to the display room where was presented a wonderful and fascinating collection of prize winning minerals, cut and polished stones, and hand made jewelry, to delight the eyes of Rockhounds and Lapidarists present.

As one Rockhound was heard to remark to a fellow cabochon cutter, there is no doubt this meeting will go down in the records of the Society as one of the most enjoyable in its history.

Gordon White
Corresponding Secretary
P. O. Box 1196
Oakland, Calif.

American Gem Society
(Nothern Ohio Guild)

The Northern Ohio Guild of the American Gem Society elected the following officers at its meeting on May 11, 1948:

President, Harold D. Myers; Vice-President, Harold H. Hubbard; Secretary-Treasurer, Elspeth Mackintosh.

Dr. Glenn C. Tague gave as his final lecture, "Organic Gem Materials: Pearl, Coral, Amber, and Jet," which he illustrated with many unusual specimens from the Department of Geology, Western Reserve University. Dr. Henry F. Donner will return in September.

Elspeth Mackintosh
Secretary,
2907 Library Ave.,
Cleveland 9, Ohio

Georgia Mineral Society
(Atlanta, Georgia)

The regular monthly meeting was held Monday Evening June 7, 1948, at 8:00 P. M. This meeting was a novel one inasmuch as we did not have a speaker, but substituted a discussion and swapping session instead.

A new constitution was adopted after several minor revisions were made and approved. The constitution as adopted will free the regular meetings of too much debate and discussion and will leave the details of most business to the executive committee with final approval still subject to the vote of the Society as a whole. Two membership categories are clearly defined as 1. Senior member being a full member and 2. Junior member being members without the voting priviledge of voting but paying a reduced membership fee.

The new officers for the coming year were elected and Captain Garland Peyton was named President; Mr. Wm. Gussow, Vice-Pres.; Mr. Sam Cronheim, Treas.; Mr. Chas. Wilkins, Recording Sec.; Dr. Frank Daniel, Historian; and S. C. Knox, Corresp. Sec. The New and Re-elected officers will take office at the close of the Annual Banquet to be held in September.

It was decided to hold regular meetings during July and August and Mr. Ken Lewis promptly invited the Society to hold its July Meeting at Fernbank, the Children's Museum, of which he is the Curator. His invitation was eagerly accepted and we look forward to a very pleasant meeting on the second Monday in July.

S. C. Knox, Corresp. Sec.
2142 Memorial Dr., S. E.
Atlanta, Ga.

Georgia Mineral Society
Field Trip June 19, 1948

With about the usual attendance the trip got under way at the scheduled time and headed south for the Pike and Upson county mineral localities. At Hampton the group stopped by the Gussows to view the large silicified log picked up at the Randall Creek locality the week before. We found the Gussows preparing to leave for California where they plan to do some collecting.

Our next stop was at Zebulon in Pike County (the county and the county seat are both named for Zebulon Pike who gave his name to Pikes Peak). Just outside Zebulon we stopped at the peat moss processing plant where we contacted Mr. McGee, owner and operator of the only known peat bog in the crystalline area of Georgia. Mr. McGee consented to go along with the party to the bog and he told of the operation and other details connected with the digging of the peat. The bog is located at the base of Pine Mtn. and was and still is being laid down on top of the Pine Mtn. Quartzite the water flowing thru and under the quartzite, thereby giving the peat a chance to accumulate. This peat is used by florists and others, mainly for plant propagation that require an acid soil.

We next visited two of the large springs that flow from the Pine mountain quartzite. A few of these springs are warm, the rest are cold, depending on the depth. The most notable spring in the area is the famous Warm Spring at Warm Springs, Ga., where the late President Roosevelt often visited for his health. The two springs visited have an enormous flow for this area and form quite large streams. The place was so inviting that we decided to eat lunch. Everyone enjoyed lunch under the cool shade of the large trees surrounding the spring.

Proceeding on to Thomaston the party drove south a short distance out of town and then left the highway to visit the Kyanite locality where the mineral was plentiful, some specimens showing a beautiful blue and some small specimens were transparent. A few small specimens of associated minerals were also found.

The Mica locality was next to be visited and the party was led back to Thomaston and then drove east for several miles to this locality where Muscovite and Biotite were plentiful. This mica has exceptionally good crystal form and some of the Muscovite crystals have a small perfect crystal of Biotite in the center, and as an added attraction an occasional piece will have a small crystal of apatite thrown in for good measure. Moonstone (Microcline feldspar) was plentiful but only in white. At this point the field trip adjourned just as a summer thunder shower came up. (It never rains on a Georgia Mineral Society Field trip.) Everyone hurried to the cars but the rain had beaten us to the road and part of the way back was accompanied by some slipping and sliding but we reached the pavement and no harm done.

S. C. Knox
Corresponding Secretary
2142 Memorial Dr. S.E.
Atlanta, Ga.

Mineralogical Society of Southern Nevada

John Wood of Henderson, president of the Mineralogical Society of Southern Nevada Inc., spoke at the regular May meeting on the mining of sulphide minerals.

Wood reviewed mining of lead ores in the Tri-State district, discussed copper mining around Butte, Montana, and went into detail on mining methods used for molybdenum and other minerals at Bishop, California, by the United States Vanadium corporation.

The group visited a Placer property on the Colorado River where members practiced gold panning. Many good colors were obtained.

Mr. T. P. Turchan, well known Engineer of Henderson, addressed the Society on the subject of CHLORINE AND THE CHLORIDES, on May 18th.

D. McMillan
Publicity Chairman

Texas Mineral Society

The following officers were elected for the ensuing year at the June Meeting of the TMS:

William H. LaDew, President; Otis Dozier, Vice-President; Ralph D. Churchill, Secretary and Treasurer.

Dr. Vernon M. Bryant, Board of Directors; Asa Anderson, Board of Directors.

The following Board members have unexpired terms:

Mrs. Robert Peck, Fred Bentley.

Ralph D. Churchill
Secy-Tres.
2003 Republic Bank Bldg.
Dallas 1, Texas

Cleveland Lapidary Society

The regular meeting of the Society was held in the Auditorium of the Arcade, on June 1st, 1948. The officers for the coming year were elected on May 4th and conducted the June 1st meeting. These officers are Dr. T. J. Turobinski, President; John M. Heffelfinger, Secretary; E. O. LaFever and Edwin A. Inkley joint chairmen of the Entertainment Committee.

The Committee arranged to have one of our members, Mr. William F. Poese, give a talk on his new book "Lore of Gem Stones" which will come off the press about June 16th, 1948.

Mr. Poese's talk centered principally around the Opal and its rather difficult road to popularity (or impopularity) down thru the ages.

He has spent a number of years collecting information for this book and part of it is devoted to letters from famous people concerning their likes and dislikes in gem stones.

The Society is going to attempt an exhibition of rough, and cut gem materials, jewelry and other interesting items in the Cleveland Public Library, and persons passing thru Cleveland may find it interesting to drop in to see this exhibit. A definite date has not been set for the exhibit but our recording of the next meeting will probably give the date.

The Cleveland Lapidary Society was organized approximately two years ago and is a relative young organization. At the present time we have some 65 members in good standing engaged in various activities such as lapidary work, geology, manufacturing jewelry, in addition to many hobbies and craft interests As time goes on we hope to improve our organization as well as our work and to make the Society an interesting organization for visitors who are in the Cleveland territory at the time of our meetings.

Our regular meetings are held in the Arcade (on Superior Avenue across the street from the Public Library near Public Square) at 7:30 P.M. on the first Tuesday of every month. Visitors are always welcome.

John M. Heffelfinger,
Secretary
7619 Redell Ave.,
Cleveland 3, Ohio

Southwest Mineralogists

The Southwest Mineralogists, Inc., have elected the following officers for the year 1948-49:

Walt Shirey, President; Frank Trombatore, Vice-Presiden; Mrs. James Creighton, Recording Secretary; Connie Trombatore, Corresponding Secretary; Pearle Arnold, Treasurer.

The Board of Directors to consist of the above named officers and, Mr. James Creighton, Mr. Henry Green, and Mr. George Schwarz.

Connie Trombatore
Corresponding Secretary
338 Pomelo St.,
Monterey Park, Calif.

Newark Mineralogical Society

A regular meeting of the Society was held Sunday, May 9, 1948, in the Science Department of the Newark Museum, Newark, N. J.

The meeting was called to order by the President, Mr. Wesley Hayes, at 3:00 p.m. The Secretary, Mr. Louis Reamer, read the minutes of the previous meeting which were approved as read. Following which the Treasurer, Mrs. I. Bemis, read her report, which was approved.

Two new members were received and elected into membership. Mr. Judd spoke of organizing a group to take up gem cutting and polishing. This suggestion was enthusiastically receved and a number of members expressed their desire to formulate plans for this interesting hobby. Some of our members have become very proficient in gem cutting and with their assistance and advice this should be a very popular group.

The guest speaker of the meeting, Mr. John H. Bertrand, Jr., of Easton, Penn., was then introduced by the President, Mr. Hayes. Mr. Bertrand spoke on the "Minerals of the Forks of the Delaware". He traced the location of many of the minerals from Mauch Chunk, Penn., to the Bucks County line. Locations in the vicinity of Easton and Northampton County were also mentioned.

The lecturer displayed many fine specimens of the minerals taken from the various locations mentioned. Some of those shown are now rarely found.

We were glad to have Mr. Bertrand with us and his lecture was enjoyed by all.

Mr. Hayes spoke briefly of his trip to Palatine, N. Y., and displayed a number of specimens found in the vicinity.

This meeting was the last of the spring session, no regular meetings will be held until the fall season. The members are looking forward to the field trips which are being planned.

The meeting was adjourned at 5:00 p.m.

Publicity Committee

North Country Mineralogical Club

Dr. John H. Rusterholtz, head of the Science Department at Plattsburgh State Teachers College, was the speaker at the April meeting of the North Country Mineralogical Club. Dr. Rusterholtz, who has taught courses in regional science, was particularly well fitted for his topic, the geology of Clinton County, N. Y. During the course of his discussion, he traced on a map the areas for Potsdam sandstone, Beekmantown limestone, Chazy limestone, and Trenton limestone. Also on the program was the next in the series of short talks on the gem of the month. Miss Judy Manwell told about the April birthstone ,the diamond.

The principal speaker at the May meeting of the Club was Louis Weinland, head of the Chemistry Department of Champlain College. Mr. Weinland spoke from a rich background of experience as an industrial chemist and a chemical engineer, fields in which he had worked before coming to Plattsburgh. He discussed the difference between "pure science" and applied science", and told of some of the more important recent developments in industrial chemistry such as nylon, the sulfa drugs, and various plastics. The vinylite group of plastics he used as an illustration of the many forms which can be given to one synthetic material by compounding with different substances. He showed samples of a number of these forms. Miss Lillian Allen discussed emeralds, the birthstone for May.

Three field trips have been held so far this season. The first, on Sunday, April 25th, was to an outcropping of diopside and graphite near Willsboro, N. Y. Here the members found not only these two minerals, but excellent specimens of calcite cleavages and actinolite.

On Sunday, May 9th, Dr. Rusterholtz piloted a field trip to an abandoned digging of iron pyrite on Mt. Pisgah, near Saranac Lake, N. Y. A picnic lunch was eaten on the grounds of Trudeau Sanatorium, and there was an opportunity to inspect the buildings of this institution.

The next field trip was held on Sunday, May 23rd. The first stop on this trip was at an esker (a sub-glacial stream bed) near Route 9, a few miles north of Plattsburgh. Here were found shells of ancient marine animals, quartzite, sandstone showing ripple marks, and varve clay. Lunch was eaten on the shore of Lake Champlain, south of Chazy, near the site of the fossilized coral reef. Those attending, secured specimens of the coral, and of brachipod, gastropod, trilobite, and graptholite fossils found in the limestone along the shore. The group went last to the limestone quarry in Chazy, where they found larger gastropods, and calcite crystals and cleavages.

Vacationists in the Champlain Valley and Adirondack regions are cordially invited to attend both our regular meetngs and our field trips. The meetings will be held as usual during the summer, at 8:00 p.m. on the second Thursday evening of each month, in the lecture room of the Plattsburgh Public Library. Information about our field trips may be secured from the Club president, William R. Ellsbury, Keeseville, N. Y.

Gertrude E. Cone,
Secretary

Maricopa Lapidary Society
(Phoenix, Arizona)

The Maricopa Lapidary Society was formed in Phoenix, Ariz., on March 15, 1948.

The first get-together was merely a meeting of 8 people to decide if such a society was wanted in Phoenix. A week later, with 14 present, the Constitution and By-Laws were drawn up. A week later, there were 50 members. The Constitution limited membership to 50 so at the May 10th meeting the Constitution was amended to allow 100 members. At present we have 59 members and several applications.

Our meeting date is the second Monday of every month at 1736 W. Van Buren St., Phoenix, Ariz., at 7:30 p.m. Visitors are always welcome and I would be glad to give any other information about the Society.

The officers are:

R. I. Hart, Pres., 70 W. Cypress, Phoenix; John Fisher, Vice-Pres., 1322 W. Palm Lane, Phoenix; Olive Miller, Secy., 3627 E. Van Buren, Phoenix; Flora Rollins, Treas., 24 W. Monroe, Phoenix.

Olive Miller, Secy.

Eden Mineral and Gem Society

The Eden Mineral and Gem Society was formed at a meeting on June 5, 1948. By-Laws for the Society were adopted and the following officers were elected:

President, Col. C. B. Branson; Vice-President, Mr. B. A. Breeden; Secretary, Mrs. Frances Taylor; Treasurer, Mrs. May Meyers; Director for three years, Mr. D. P. Phillips; Director for two years, Mr. L. O. Taylor; Director for one year, Mr. T. P. Robb.

Mr. B. E. Sledge and Mrs. Anita Phillips will serve with the Executive Committee as Immediate Past-President and Corresponding Secretary, respectively.

The meeting was held at the home of Mr. and Mrs. B. E. Sledge, 8679 Castro Valley Blvd., Castro Valley, California.

The purpose of the Society is to further interest in the knowledge of minerals and lapidary work. The next meeting of the Society will be held on Friday, July 9, 1948, at 8:00 p.m., at the home of Mr. and Mrs. D. P. Phillips, 20730 Lake Chabot Rd., Castro Valley.

(Mrs.) Anita M. Phillips
Corresponding Secretary
20700 Lake Chabot Road
Hayward, California

BIBLIOGRAPHICAL NOTES

POPULAR GEMOLOGY:
By Richard M. Pearl

The latest book on gems is *Popular Gemology* by Richard M. Pearl, which came off the press about June 1st, 1948. The author is one of America's most noted gemologists and mineralogists, writer of a number of books and many articles on gems and minerals, founder of the Rocky Mountain Federation of Mineral Societies, co-founder of the American Federation of Mineralogical Societies and the Colorado Mineral Society, Honorary Vice-President of the Gemmological Association of Australia, Fellow of the Gemmological Association of Great Britain, and a member of the Rocks and Minerals Association.

Mr. Pearl earned his B.A. and M.A. at the University of Colorado; holds an A.M. and is candidate for a Ph.D. at Harvard University. His career includes experience as an engineer for the Du Pont Company, and as a geologist for the Shell Oil Company. He is now Assistant Professor of Geology at Colorado College.

Popular Gemology is intended to present in popular language for the general reader the most recent accurate information about the world of gems. It is divided into 8 chapters as follows: 1. The lure of gems; 2. Recognizing gems; 3. Faceted gems; 4. Cabochon and carved gems; 5. Gems of the silica group; 6. Gems with a genealogy; 7. Man-made gems; 8. Luminescent gems. An extra chapter (Selected reading) is also included.

The book, with its many fine illustrations, is a storehouse of valuable information on gems which includes their occurrence, properties, methods of cutting, etc. not only for the average reader but for the advanced gemologist as well. A special feature of the book in the chapter on fluorescent (luminescent) gems.

Popular Gemology is 5¾ x 8 inches in size, contains 316 pages, 115 illustrations, costs $4.00 a copy, and is for sale by the publishers, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

P. Zodac

GEM CUTTING:
By J. Daniel Willems

Since 1931, when the first printed information on the fascinating art of cutting and polishing gems was printed by *Rocks and Minerals* (The Working of Semi-Precious Stones, by J. H. Howard), quite a number of books on the subject have made their appearance. The latest book is *Gem Cutting*, by J. Daniel Willems. In this book the author presents the latest methods and techniques of cutting and polishing, many of which are discoveries of his, the most noted of which is the Willems faceting device.

Dr. Willems (a noted surgeon of Chicago, Ill.) is a member of the Rocks and Minerals Association. He took up lapidary work as a hobby. The story of how he and Mrs. Willems became interested in curious and attractive stones is told in the opening paragraph of the new book.

In the book, Dr. Willems shows in accurate clear detail with step-by-step drawings, the planning and cutting for both cabochons and faceted stones. Not only does he include the faceting for the circular stone, but also various odd shaped stones as well. Another important point is that he not only discusses the actual operation, but tells the tools and equipment needed, the materials, sources of the various stones and other details. All in all it is a most valuable book for both the amateur and the professional cutter.

The book is well illustrated—all details of text and illustrations are clear and complete. It is written in simple language, too.

Gem Cutting is 6¼ x 9 inches in size, contains224 pages, 85 illustrations and frontispiece of beautiful cabochons and faceted gems in color, sells for $3.50, and is published by the Manual Arts Press, Peoria 3, Illinois.

P. Zodac

BIOGRAPHY OF THE EARTH:
By George Gamow

This is a story about the earth, its age, climates, ancient life, rocks, mountains and other facts. The author is Professor of Theoretical Physics at George Washington University. He tells us, for example, that the central part of the earth, about ⅛ in volume, consists of almost pure iron, in a liquid state. That mountains have roots sinking deep into the body of the earth. That the earth is passing today through the last stages of a glacial period. These and other geological wonders are revealed in this new book which came out on April 30, 1948.

Biography of the earth is a pocket size handbook full of vital and interesting information about our wonderful world. It is 4¼ x 7 inches in size, contains 194 pages, 62 illustrations, 28 plates, and sells for only 35c. For sale by the publishers, New American Library of World Literature, Inc., 245—5th Ave., New York 16, N. Y.